MSB TECHNOLOGY

Network Renderer Module

Analog DAC, DAC V, Select DAC

User Manual

Revision 1.3 (12/5/2015)

This manual applies to all the MSB Renderer products but illustrates its operation using the Analog DAC.

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1. Introduction

Thank you for choosing the MSB Network Renderer module. Please take a few moments to read through the relevant sections of the manual for important installation and setup information.

The MSB Network Renderer is a small input module for the Analog DAC, the DAC IV or the DAC V line, but it contains some very complex technology. The most important part of the design is a passionate attention to audio quality, but at the same time it provides you with the ability to enjoy network based audio.

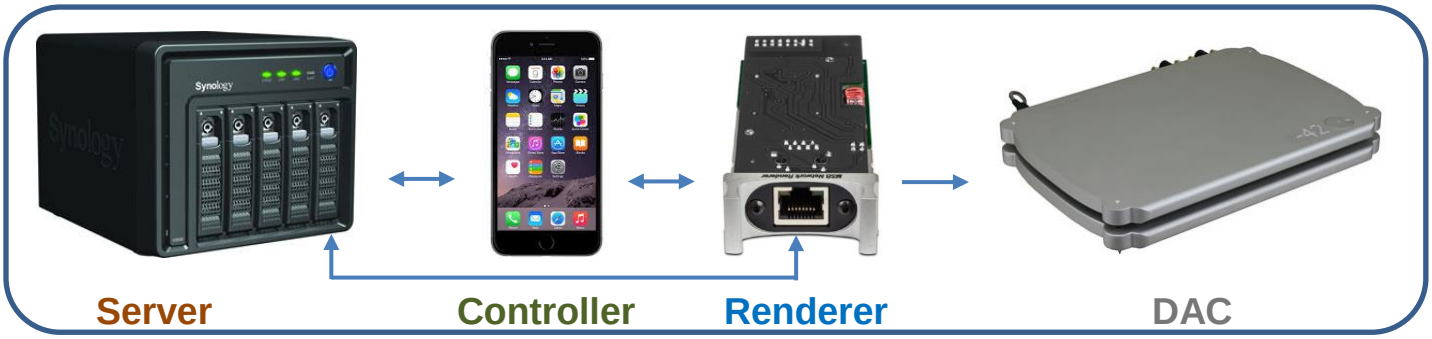
You will now be able to use a variety of audio sources, from computers to network attached storage (NAS) devices to stream audio files directly to your MSB DAC using an Ethernet cable. In addition you can use your pads, tablets, or phones to access your music library and manage audio playback.

An understanding of the various parts involved in network audio is important and can initially be daunting, so we have included a chapter below on UPnP (Universal Plug and Play) concepts along with a few examples of system setup to get you started with enjoying network based audio

1.1 Overview

There are many naming conventions and terminology used with this class of product, so let's start with a picture.

Diagram 1: Network Audio Components



In simple terms, audio files are stored on a **Server**, which can be a laptop, desktop computer or network attached storage (NAS) device.

A **Controller** is a program that runs on a laptop, tablet, or phone, and accesses your music library and asks the **Server** to serve the files to a **Renderer**.

The **Renderer** receives and converts the audio files into a digital audio stream which is then sent to the DAC.

The **Server, Controller and Renderer** are all connected on your home network

The **DAC** receives the digital audio stream from the **Renderer** and converts it into analog audio. It is very sensitive to noise and requires a very low jitter clock. The advantage of plugging the MSB **Renderer** into the MSB DAC is:

1. Clock is synchronized by the very low jitter DAC master clock
2. Grounds are isolated and dedicated clean power is provided

MSB DACs are designed with modular inputs to take full advantage of the Network Renderer Input Module, and the results are stellar.

There is a huge selection and variety of software and hardware combinations that can fulfill each of these networked audio functions. In this manual we will show you a few examples to get you started with enjoying the MSB Network Renderer, but is by no means the only way of setting up your Networked Audio system.

1.2 Features

Main Features

1. Digital Media Renderer
2. UPnP AV 2.0 / DLNA
3. Plays and decodes common audio formats from HTTP streams
4. PCM (Pulse Code Modulation) resolution up to 32 bits, with sampling rate up to 384kHz
5. One-bit DSD (Direct-Stream Digital) in DSD64 (2x), DSD128 (4x), and DSD256 (8x)
6. Internet Radio (depends on UPnP Server and Controller software and stream availability)
7. Bit-perfect data transmission
8. Support for gapless playback (depends on UPnP Server and Controller software)
9. On-board low-jitter oscillators
10. DAC master clock synchronization
11. Ethernet RJ45 input
12. I2S digital audio output
13. Compact and low EMI design

Supported Audio formats

1. FLAC (Free Lossless Audio Codec)
2. WAV (Waveform Audio File Format)
3. MP3 (Mpeg Audio Layer 3)
4. ALAC (Apple Lossless Audio Codec)
5. AAC (Advanced Audio Coding)
6. AIFF (Audio Interchange File Format)
7. DSF and DFF (DSD stream file)

1.3 In the Box

1. MSB Network Renderer
2. User Manual

2. Quick Start

Although the MSB Renderer module is physically small, it is a key part of a networked audio system, which can be quite complicated and multi-faceted.

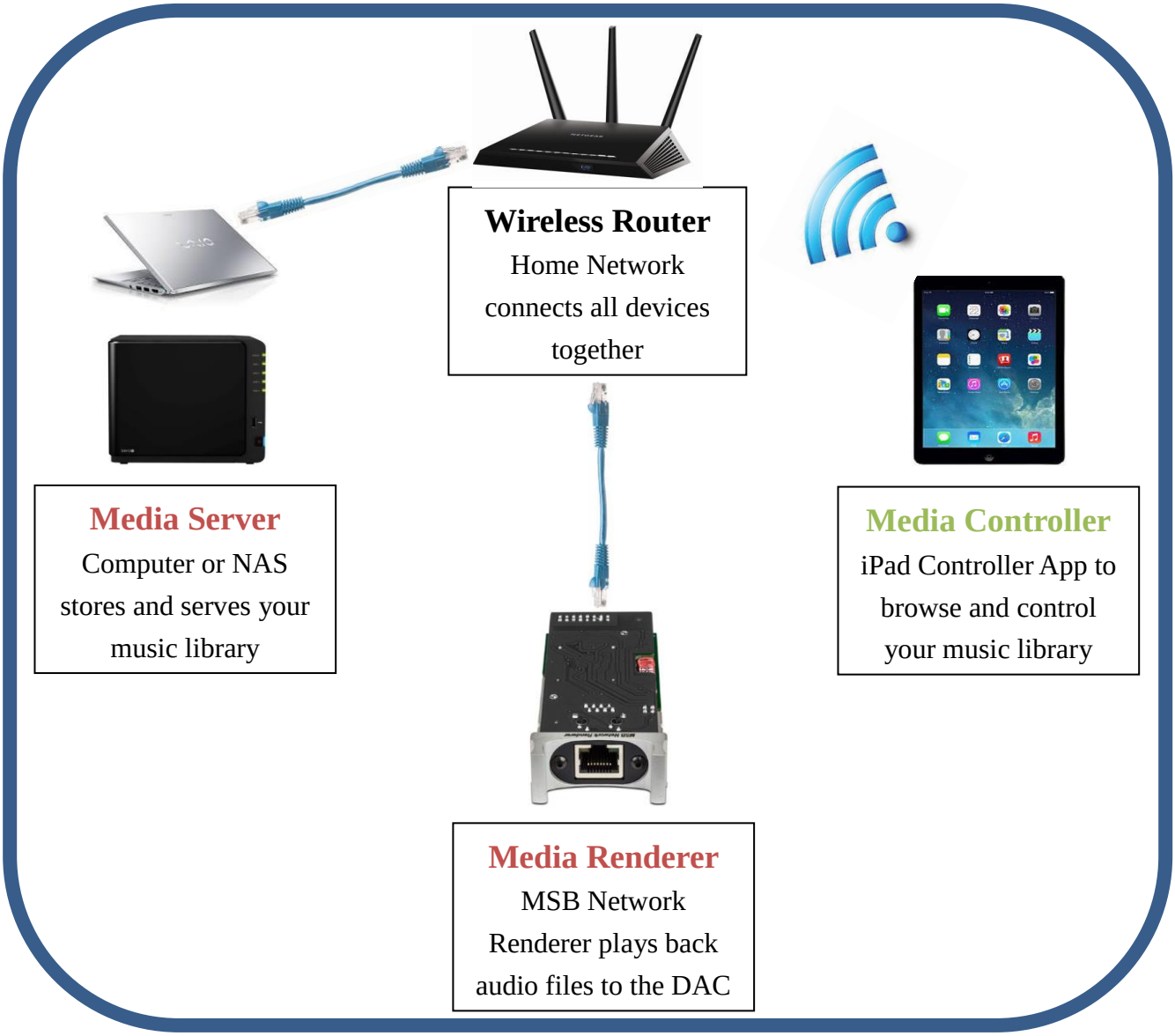
This manual allows an absolute beginner to follow all the steps and examples to become more comfortable with networked audio. And for the experienced user who is replacing or adding to their current networked audio setup with the MSB Renderer, this manual can serve as a refresher or a reference.

There are a few ways in which you can quickly start enjoying your MSB Renderer module and just utilize the chapters in this manual that are of interest:

1. Your dealer has already setup and installed your module
2. You are already familiar with the concepts of UPnP/DLNA networked audio
3. You are already using an UPnP server and UPnP controller setup

Starting on the next page, a simple 8-step summary is provided so that you can start using your MSB Renderer as quickly as possible. Please note that this does assume a level of experience and installation completion. For detailed installation information of various elements, links to internet guides and program download sites, please refer to the relevant chapters in this manual.

Typical Networked Audio

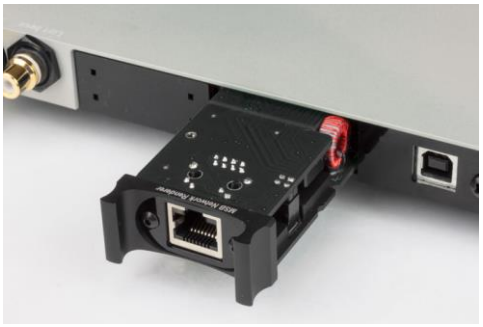

Wireless Router
Home Network connects all devices together
Media Server
Computer or NAS stores and serves your music library
Media Controller
iPad Controller App to browse and control your music library
Media Renderer
MSB Network Renderer plays back audio files to the DAC

For a typical networked audio system setup, the following is required:

- MSB Network Renderer module installed in the DAC
- iPad connected via WiFi to your Home Network and running an UPnP controller such as the AudioNet IMM, Lightning DS or Linn Kinsky Application
- Home Network setup, including WiFi connection
- A computer or a NAS (Network Attached Storage) as your music library server running an UPnP server such as Jriver Media Center (computer only) or MinimServer
- And of course amplification and speakers

Step 1: Install the MSB Renderer

Install the MSB Renderer module into the desired slot within the DAC. Connect your DAC to your pre-amplifier or amplifier.



Step 2: Connect to your Home Network

Connect the MSB Renderer and your Music Library Computer or NAS to your Home Network router with WiFi capability, using Ethernet cables

Step 3: Turn on the MSB Renderer

Turn on the DAC and select the STR (Streamer) input for the MSB Renderer

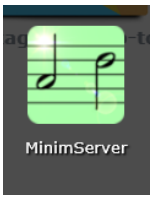
Step 4: Connect your iPad

Connect your iPad to your Home Network using WiFi

Step 5: Turn on your UPnP Server

Turn on your computer or NAS and start the UPnP Server of choice

- Using a NAS MinimServer is recommended
- Using a Computer Jriver Media Center (JRMC) or MinimServer is recommended
- Make sure you have music files loaded in the required music folder and library indexing is complete for the UPnP Server



Step 6: Turn on your UPnP Controller

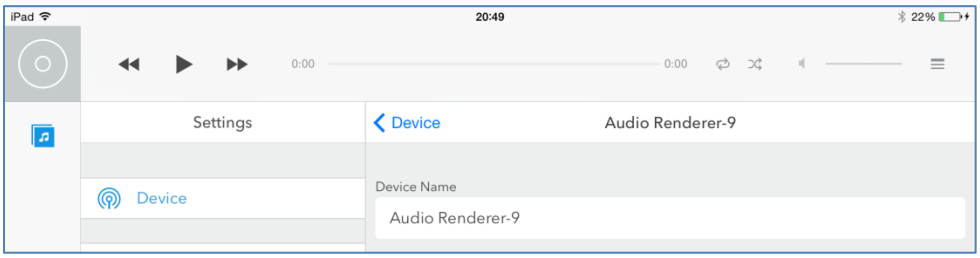
Turn on the UPnP Controller App of choice on your iPad

- Free ones to start with are Linn Kinsky or Lightning DS
- Audionett IMM is also a good one but costs for the unlimited version
- If you are using Jriver Media Center (JRMC) on a computer the JRemote control application is recommended but not free

Step 7: Select your MSB Renderer on the iPad

Select the MSB Renderer from your iPad UPnP Controller:

- Wait a few moments for the **Audio Renderer –X** to show up in your UPnP Controller and select it as the playback device. This is the default name for the MSB Renderer, where X is the last digit of the IP Address given to the MSB Renderer by your router

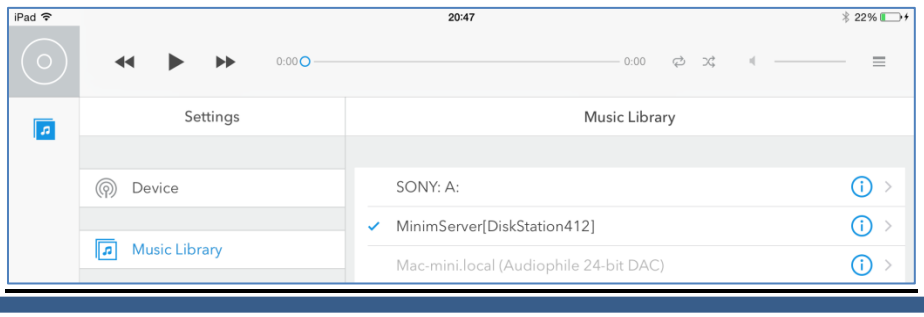


Step 8: Select your UPnP Server on the iPad

Select the UPnP Server containing your music library from your iPad UPnP Controller:

- When your UPnP Server is running it will automatically be seen in your Controller App. The first time you select the library it might take a while to load the library index and album art.

Now start browsing your music library and playing back your music. Enjoy!



3. Module Installation

The installation of the MSB Network Renderer can be done by your dealer or, since it is quite simple to do, with a few steps shown below and a screwdriver you can complete it within 5-10 minutes.

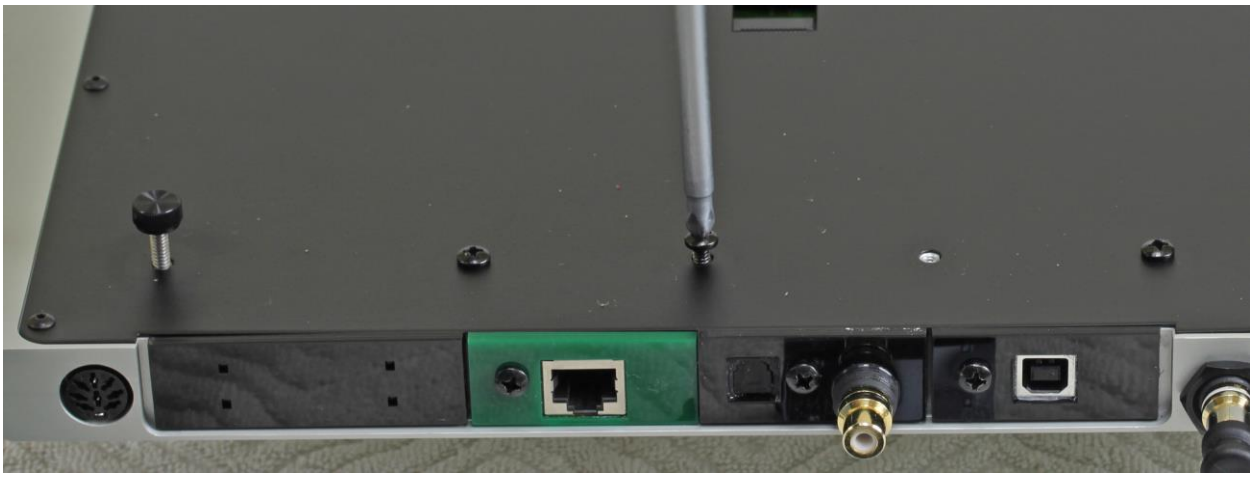
The modules are designed to be easily installed or replaced. Please follow these instructions.

Step 1: Determine which slot to use

The order of the modules determines the priority of input selection in the auto-select mode. The highest priority input will always interrupt the lower priority. So if you have a source that is always on, it should be set as the lowest priority so any other source can interrupt it. The highest priority input is closest to the analog outputs.

There is no sonic difference in which slot you use for the Network Renderer module.

Please note: Do not use the slightly larger looking slot adjacent to the power input.



Step 2: Disconnect the DAC from any power or audio cables

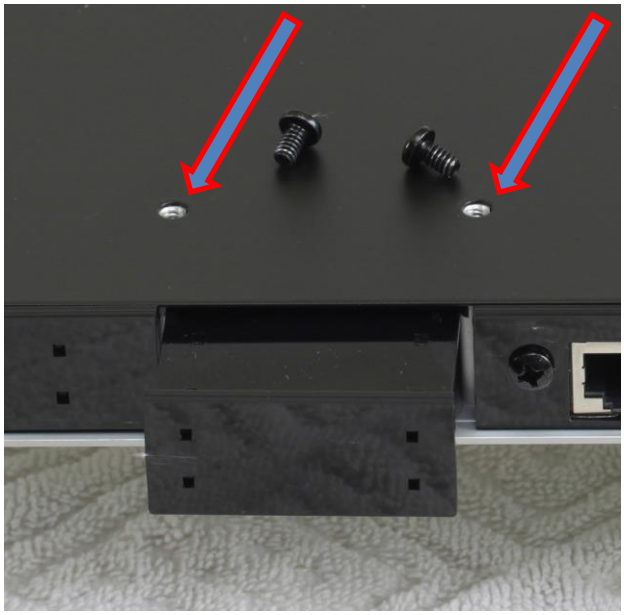
Make sure you do not ha connected to the DAC, especially power.

Turn the DAC over and place it on a soft surface like a towel.

Step 3: Open up the desired slot

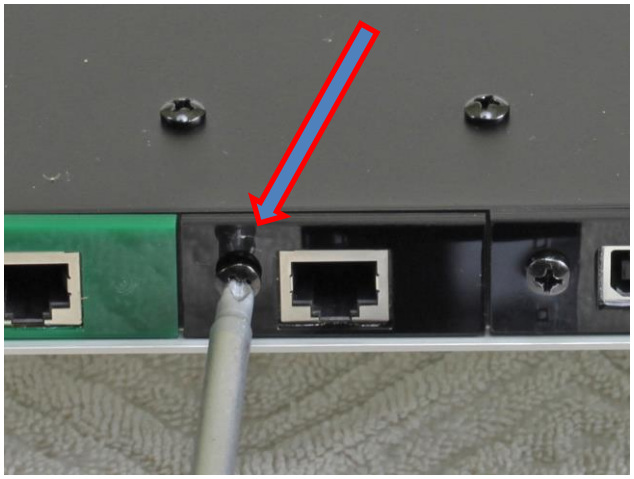
You can either switch out an existing module, or remove the plastic dust cover of an empty slot.

1. When installing a module in an empty slot, remove the two screws on the bottom adjacent to the module. Then remove the black plastic dust cover. It is easy to remove with your fingers when the two screws are removed and slides out.

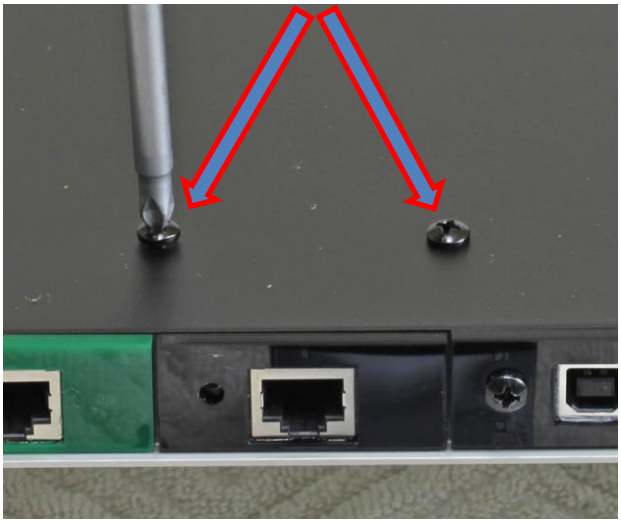


2. When swapping out a module that is already installed, first remove the installed module.

   To remove a module from the space you have selected for the Network Renderer module, first remove the Phillips head screw in the jack panel at the front of the input module if it has one. Some modules do not have this screw, in which case you can skip this step.



2b. Next, remove the two screws on the bottom adjacent to the module.



2c. Next, remove the knurled screw from the base of the DAC, near the power input plug.

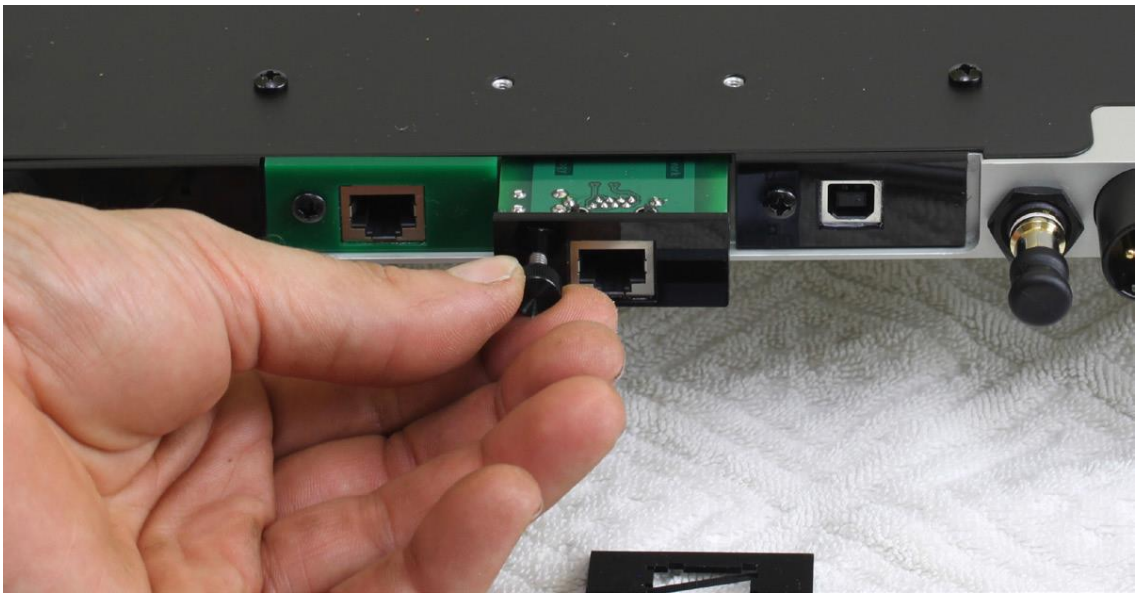
This is your removal tool.

Please note: If the module does not have a Phillips head screw in the jack panel at the front of the module, you can skip the next two steps and just gently remove the module from its slot. Wiggle gently if needed. The module will slide out along the grooves within the DAC.

2d. Screw it in hand tight into the back of the Input Module.

Please note: Do not force it. Please double check that you have removed the necessary screws if it requires too much force.

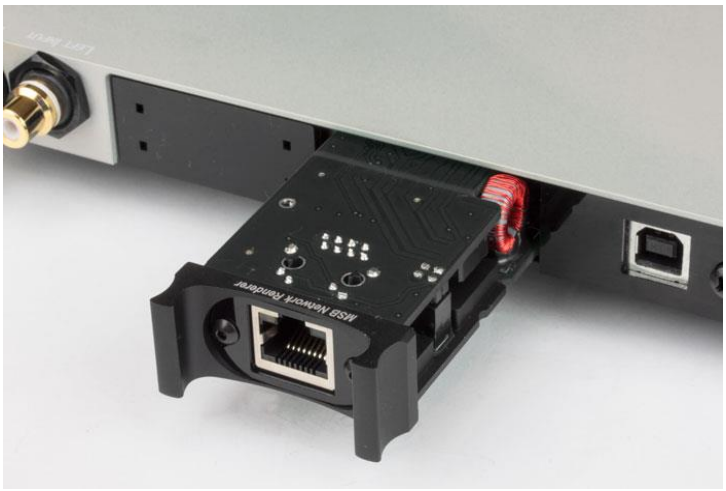
2e. Pull firmly on the removal tool. Wiggle gently if needed. The module will slide out along the grooves within the DAC.



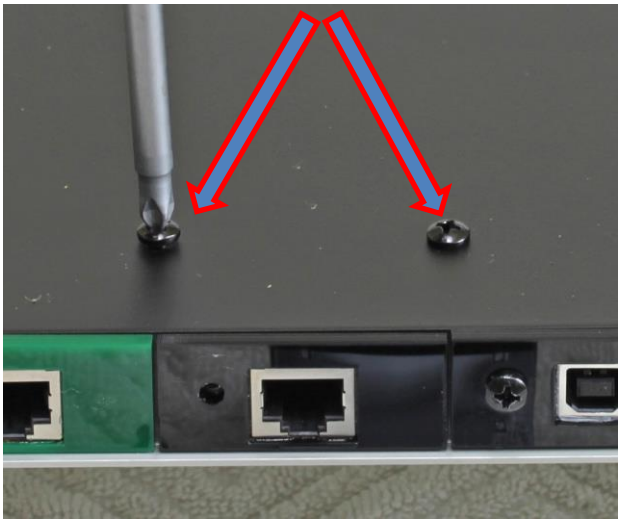
Step 4: Install the Network Renderer Module

To install a new module, slide the new module into the grooves on both sides, and push firmly into place. There are handy metal ears on the front of the module that allows for ease of handling.

Please note: Do not force it. It should slide easily along the grooves if aligned properly.



Now put the screws back into the base, and return the installation tool to its place on the base.



Step 5: Verify Your Firmware

- The MSB Renderer module does require the latest DAC firmware. For the Analog DAC for example, the firmware M16 and D16 are required to make the Renderer show up as the **STR** (Stands for **Streamer**, which is another term for Renderer) input and be functional.
- Please check the following MSB Tech Support website for the required firmware for your DAC and follow the instructions:
    - http://www.msbtech.com/updates/updateHome.php

Congratulations!

Your MSB Network Renderer module is now ready for use.

4. UPnP / DLNA Guide

When first diving into the world of networked audio it can be quite confusing, with the amount of different terms used and the huge variation of hardware and software available. To provide you with a basic understanding of some of the main terminology, we have provided you with a helpful summary guide focused on the audio aspect of UPnP, UPnP AV and DLNA below.

If you are already familiar with the UPnP concepts and would like to start setting up your system you can skip to the next chapter.

The MSB Network Renderer is UPnP AV 2.0 and DLNA compliant, but what does that mean?

3.1 UPnP (Universal Plug and Play)

UPnP stands for Universal Plug and Play and is one of the most common networked audio architectures, allowing devices to communicate with each other using common Internet technologies. It is a common protocol, or set of rules, that governs the communication between computers and devices on a network. In other words, in order for two devices to talk to each other, they must speak a common language, which UPnP provides.

An UPnP compatible device from any vendor can dynamically join a network, obtain an IP address, advertise its name and capabilities, and learn about the presence and capabilities of other devices in order to communicate.

3.2 UPnP AV

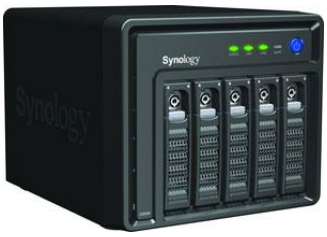
UPnP AV is an audio and video *extension* of UPnP, supporting a variety of devices such as TVs, CD/DVD/BD players, Receivers, Cameras and personal computers. It allows devices to support different types of formats of audio and video entertainment content.

In version 2.0 of UPnP AV, the Media Server (MS) and Media Renderer (MR) enhancements added important capabilities allowing for a higher level of interoperability between products made by different manufacturers. It specifies three important components of networked audio, each with its own services for audio playback:

1. **Media Server**
2. **Control Point**
3. **Media Renderer**

Diagram 2 below gives a quick overview of these 3 main components with some of their many different alternate labels shown in the table below, which are either elements of, or used interchangeably.

Diagram 2: Network Audio Terminology



Server **Controller** **Renderer**

Media Server	Control Point	Media Renderer
UPnP Media Server	UPnP Media Server Control Point	UPnP Media Renderer
Digital Media Server (DMS)	Digital Media Controller (DMC)	Digital Media Renderer (DMR)
UPnP AV Media Server	UPnP Rendering Control DCP	Streamer
	UPnP Remote User Interface (RUI)	
	UPnP AV Client Devices	
	UPnP Control Point	

1. Media Server

The media server can be seen as two entities combined into one, the physical hardware and the software side. Physically it is the main location for your music library and contains all your music files. You audio library can be stored on a computer (Apple, Windows or Linux) or on a NAS (Network Attached Storage –a specialized, often Linux based, file sharing computer).

From the UPnP software perspective, the media server is an **UPnP Media Server** program which needs to be running continuously in the background on the computer or NAS, and will need to be connected to your home network. The job of the **UPnP Media Server** is to advertise itself on the network and to 'serve' the audio files to the 'Renderer' when asked to do so by the Controller. It will also provide the Controller with audio file metadata and format.

Hardware and network reliability as well as UPnP Media Server program stability and file handling capability are crucial. A gigabit network is highly recommended to avoid dropouts.

Some popular **UPnP Media Server** programs are:

- Jriver Media Center (Not available on a NAS, but handles both PCM and DSD)
- MinimServer (Handles both PCM and DSD playback)
- Foobar (Uses Bubbleguuum component as the UPnP media server)
- Synology Media Server (Only available on a Synology NAS)
- Logitech Media Server (LMS)
- Plex

2. Controller

Every system needs a way to find and select the music you want to play. This is the Controller or **Media Server Control Point** in UPnP terminology, which essentially is a program that runs on a handheld device like a phone, pad, laptop or tablet and acts as the remote control for your music library.

The Controller does not get involved with the actual processing or playback of the file, but it acts as a traffic controller for your music files and is the user friendly music library interface for you. It has absolutely nothing to do with audio quality as it just communicates with the server and renderer and sends instructions.

The Controller checks for any available UPnP Media Servers that are on the network, it shows you what music you have in your library and helps you find the music you want to play. When you have made your selection, it tells the 'server' to send the audio file to the 'renderer' for processing.

It is the Controller’s task to keep track of the song position, communicate commands such as play, pause, skip forward or backward to another song, fast forwarding and rewinding within the song, or allow for creation of playlists for sequential playback.

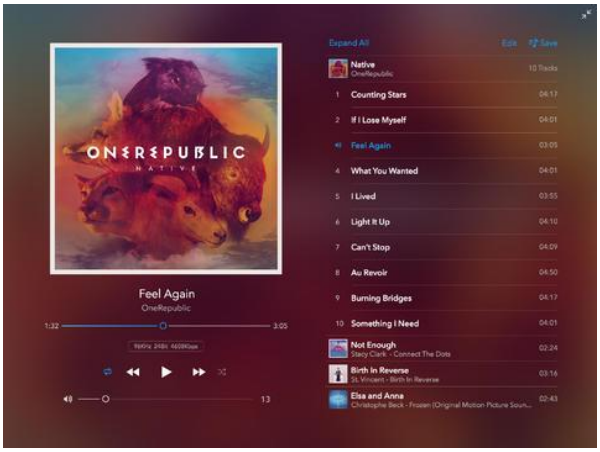
Gapless playback, where sequential songs from for example a live concert blend seamlessly from one to the next, is important but tricky. Gapless playback requires both the controller and renderer to be capable and communicate at the right time. The MSB Renderer module is capable of gapless playback, but there are very few UPnP controller programs that do this well. There is

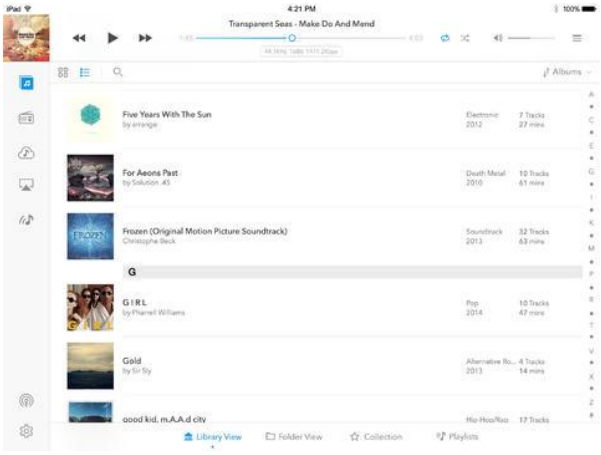
an alternative to the UPnP Control Point that is much better with gapless playback called Open Home Media (ohMedia) which will be covered briefly later in this chapter.

Some popular **UPnP Control Point** programs are:

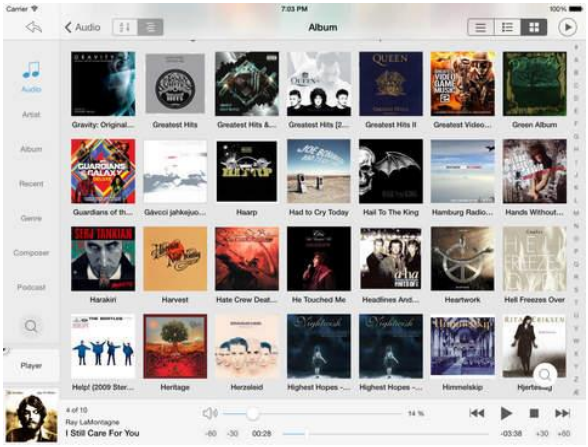
- Jriver Media Center (In conjunction with its remote application JRemote)
- Lightning DS by Auralic
- Kinsky by Linn
- PlugPlayer (It can also act as a Renderer on your handheld device)
- Bubble DS (Android only)
- Audionett iMM
- Foobar

Some examples of what a controller looks like on your handheld device:





The Great Gig in the Sky
The Dark Side of the Moon
Pink Floyd
AC/DC
Ballbreaker
Black Ice
Dirty Deeds Done Dirt Cheap
For Those About to Rock We Salute You
High Voltage
Highway to Hell
If You Want Blood, You've Got It
Iron Man 2 [Deluxe Edition], Disc 1
23. The Great Gig in the...
24. Money
25. Have A Nice Day
26. We Will Rock You
27. Clowns
28. Last Living Souls



3. Media Renderer

Now here is the heart of the network audio system. The Renderer receives the audio file from the Media Server and creates from it a digital music stream to be sent to and converted into analog audio by a DAC. It communicates with the Controller and acts on transport commands such as play, pause, skip forward or backward to another song, fast forwarding and rewinding within the song. It also provides controller with information on formats it can accept, such as:

1. Sample rates that can be played (e.g. 44.1, 192, up to 384 KHz)
2. File formats that can be decoded (e.g. FLAC, MP3, etc.)
3. DSD compatibility up to DSD256

The Renderer needs a low jitter clock and clean power, which is provided by the MSB DAC's master Femto second clock and its multi-rail isolated linear power supply.

3.3 DLNA (Digital Living Network Alliance)

DLNA (Digital Living Network Alliance) is a trade organization established by Sony, and is responsible for defining interoperability guidelines and certification to enable the ease of sharing digital media between multimedia devices on a local network.

DLNA uses Universal Plug and Play (UPnP) for media management, discovery and control, but then applies a **layer of restrictions** over the types of media file format, encodings, resolutions and audio file transcoding that a device must support to achieve interoperability. Generally DLNA certified devices will work with UPnP devices but always vice versa.

3.4 OpenHome Media (ohMedia)

OpenHome Media (ohMedia) is an open standard for networked audio devices created by Linn, which has better support for playlists, allowing gapless playback to continue when the Controller leaves the network or if you navigate to another program on your Controller. In addition, the CD quality streaming service Tidal (Called WimP in Europe) can be accessed using ohMedia emulation. Devices can implement ohMedia in place of, or alongside the UPnP AV protocols.

There are other potential benefits if implemented such as multiple control points, room control, and native support for Songcast, internet radio and Apple's AirPlay, as well as the ability to use a few very well designed ohMedia Controllers.

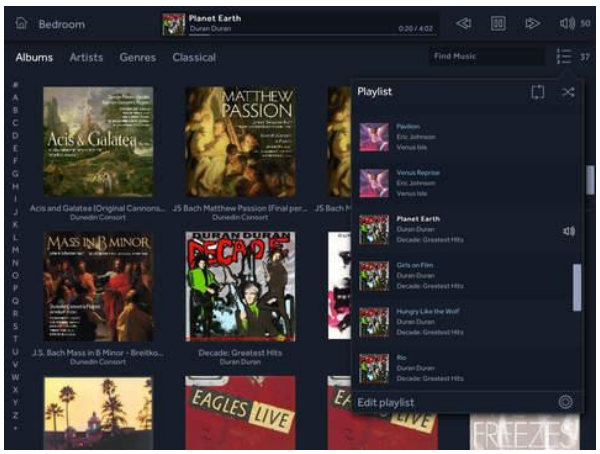
Please note that at this point the MSB Network Renderer module is not Open Home Media certified, but there is an emulation program called *Bubble UPnP Server* which allows the MSB Network Renderer to be seen as an Open Home Media Renderer. The emulation server setup will be covered in Chapter 7 of this manual for a NAS setup, and is for the more advanced users.

For more detail, the following website is the place for the program information, download and instructions:

- http://bubblesoftapps.com/bubbleupnpserver/

ohMedia Controllers:

- Kazoo by Linn –Has a Tidal streaming function
- Lumïn
- Kinsky by Linn, PlugPlayer, Lightning DS by Auralic controllers can also function in ohMedia mode



3.5 Conclusion

Networked audio is a great way to enjoy music without necessarily having your computer or NAS in the same room as your listening equipment, potentially lowering your noise floor. With the variety of options to control your music library, and with the ability to easily browse and playback your complete library from the comfort of your listening chair, using the MSB Renderer is truly a joy.

Keep in mind that you would still need a program to maintain your library, edit tags, add album art, rip CDs, etc., but one of the software options mentioned, Jriver Media Center, can do all of these actions on a Macintosh or Windows computer, in addition to being the UPnP/DLNA Media Server and Controller.

It is crucial for a networked audio system to have a reliable wired and wireless network setup. There are so many options of setting up your network with all the routers, switches, and wireless access points available to a consumer, but those will not be covered in this manual. It is recommended to use a gigabit network to avoid drop outs, and it is assumed that you have a stable home network already in place. A wired Ethernet connection is the best for streaming audio files between the Media Server and the MSB Renderer, but for the Controller on your pad or phone a wireless connection is perfect.

If you would like to dig deeper into the technicalities of UPnP, UPnP AV, DLNA and ohMedia, below are a few helpful internet sites with more detail:

- http://en.wikipedia.org/wiki/Universal_Plug_and_Play
- http://en.wikipedia.org/wiki/Digital_Living_Network_Alliance
- http://www.openhome.org/wiki/OhMedia
- http://www.computeraudiophile.com/content/524-complete-guide-hifi-upnp-dlna-network-audio/
- http://bubblesoftapps.com/bubbleupnpserver/

Now that you have a clearer high level understanding of UPnP, how it works and the various associated extensions, we can go to the next step of setting up a Networked Audio system with the MSB Renderer.

5. Networked Audio Setup

So what is the best way to integrate the MSB Renderer into an audio system? Well that depends on your vision of what that perfect system looks like and your personal preferences of hardware, operating system, software, and handheld device for a controller. Below we will take you through the setup of a few sample systems. We are not saying that the hardware and software we picked in the examples are better than other brands or options, but these are good options to start with to enjoy your MSB Renderer.

In the next chapters we will cover the networked audio setup using a:

1. Computer Based System

- Macintosh or Windows computer with Jriver Media Center as the UPnP Media Server and UPnP Control Point
- Jremote application as the remote control on an iPad
- MSB Network Renderer

2. NAS Based System

- Synology Network Attached Storage device (NAS) running on Linux
- MinimServer as the UPnP Media Server
- Lightning DS as the UPnP Controller on an iPad
- MSB Network Renderer

As you set up and become comfortable with your networked audio system you might decide that a different approach works better for you. That is the flexible aspect of a Networked Audio system using UPnP/DLNA, as there is a huge variety of hardware and software available to meet your preferences. In addition many of the software packages mentioned in this document are also being continuously improved upon by their developers, and new ones become available as well.

6. Computer Based Setup Example

The first decision is whether to use a Windows based or Macintosh based computer. Both work well and it really comes down to personal preference of computer hardware and operating system. One of the more stable and popular UPnP/DLNA programs, **Jriver Media Center (JRMC),** is available for both Mac and Win platforms. In addition it is a great tool for audio library management and handles both PCM and DSD playback. It is a program that can do much more, but we will focus here on setting it up as an UPnP/DLNA Media Server and Controller.

Below we will show you step-by-step how to optimally setup Jriver Media Center (JRMC) as an UPnP/DLNA Media Server and Controller for use with the MSB Renderer on both a Mac and Windows based computer, as initially you can get lost in all the various setup screens available.

For the remote control we will be using the **Jremote** application on the iPad, which is an excellent way to access and command your music library. Important to note is that Jremote is not an UPnP Controller but it is purely a remote control program for Jriver Media Center only. JRMC can function as the UPnP Media Server ***and*** UPnP Controller at the same time, and it is because of this that gapless and playlist playback with JRMC and Jremote is so smooth.

You can of course use any of the other UPnP Controller applications with Jriver Media Center, but Jremote is tailor-made for JRMC and will be much more user-friendly.

Because listening to internet radio is often a desired feature, below there will be a few simple steps shown on how to listen to internet radio using your MSB Renderer and JRMC.

There are separate sections for the setup examples so you can skip to the section which is of interest. The Jriver Media Center setup follows the same steps whether you are using a Macintosh or Windows based computer setup.

Computer Based Setup Chapters:

- 6.1 Macintosh Based Computer System Example
- 6.2 Windows Based Computer System Example
- 6.3 Examples Afterthought
- 6.4 Jriver Media Center Setup
- 6.5 Jremote Setup
- 6.6 Internet Radio in JRMC

6.1 Macintosh Based Computer System Example

Hardware and Network Setup

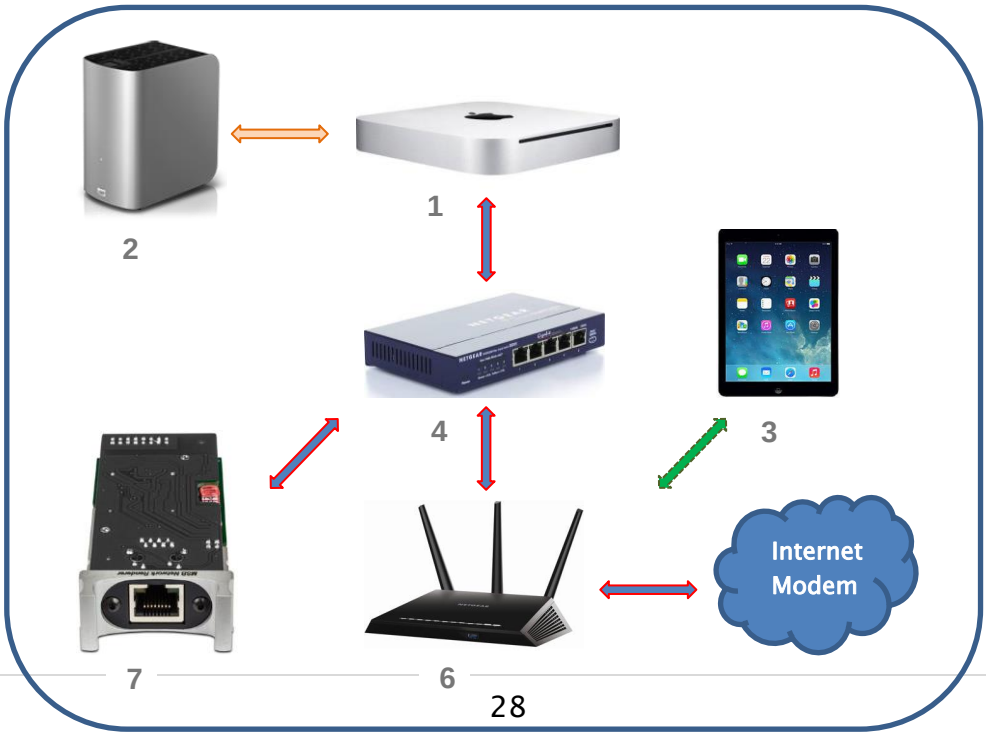
We assume you have already setup and turned on your home network and:

- Your Macintosh can access the internet and is hard-wired to the home network
- Your wireless device (Pad, Phone, Tablet), which will run the Controller, has access to your network and the internet via WiFi
- The MSB Network Renderer is connected to the Macintosh computer via a Gigabit switch, and is hard-wired with quality Ethernet cables
- Your MSB DAC has the latest firmware, the MSB Renderer module is installed in the DAC and is turned on

Hardware used in this example:

1. Mac Mini with Mavericks OS 10.9.5 (Mavericks) running JRMC in UPnP/DLNA mode
2. WD Thunderbolt Duo 4TB external hard drive for audio files
3. iPad Air with 16GB memory running JRemote connected through WiFi
4. Small gigabit switch from Netgear, the ProSafe GS105
5. Certified Ethernet Cat6a cables from Blue Jeans Cable (Shown as ⟺ in Diagram 3)
6. Netgear Nighthawk AC1750 (R6700) Wireless Dual Band Gigabit Router
7. MSB Network Renderer

Diagram 3: Macintosh Based Network Audio Example



6.2 Windows Based Computer System Example

Hardware and Network Setup

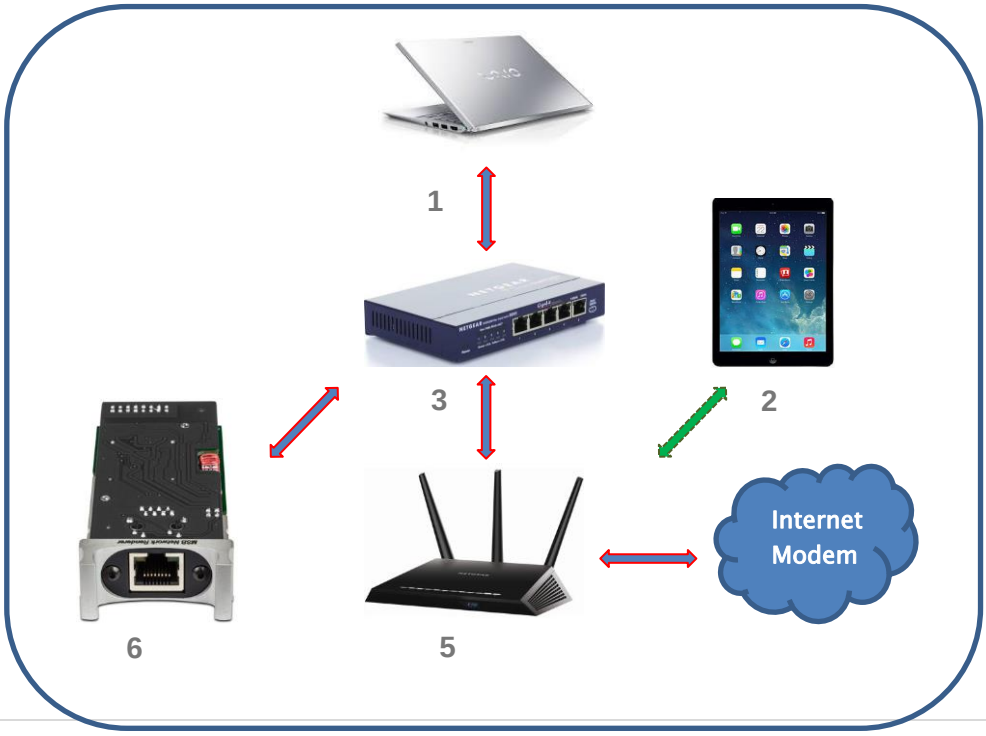
We assume you have already setup and turned on your home network and:

- Your PC can access the internet and is hard-wired to the home network
- Your wireless device (Pad, Phone, Tablet), which will run the Controller, has access to your network and the internet via WiFi
- The MSB Network Renderer is connected to the Windows computer via a Gigabit switch and is hard-wired with quality Ethernet cables
- Your MSB DAC has the latest firmware, the MSB Renderer module installed in the DAC and is turned on

Hardware used in this example:

1. Sony Vaio laptop with Windows 8.1 running JRMC in UPnP/DLNA mode
2. iPad Air with 16GB memory running JRemote connected through WiFi
3. Small gigabit switch from Netgear, the ProSafe GS105
4. Certified Ethernet Cat6a cables from Blue Jeans Cable (Shown as ⟺ in Diagram 4)
5. Netgear Nighthawk AC1750 (R6700) Wireless Dual Band Gigabit Router
6. MSB Network Renderer

Diagram 4: Windows Based Network Audio Example



6.3 Examples Afterthought

A few additional thoughts with regards to the sample setups shown above in Diagram 3 and 4:

- An external WD Thunderbolt drive is optional for extra space depending on how large your audio library is or will be in the future. External Firewire and USB drives or even a large or second internal drive are other alternatives for extra audio library space.

- Some Internet Modems provided by your internet provider might already contain a WiFi router and switch functions, in which case it could be used instead of the wireless gigabit router shown in the example. However, keep in mind that most modems provided are not gigabit speed and you might not have full control.

- There is a huge variety in quality and stability amongst wireless routers. The newest and advertised fastest ones are not necessarily more stable. A basic 802.11 AC type with an inbuilt gigabit switch will be fast enough. A 5 GHz antenna will help reduce interference from other devices in your home but is not required.

- Wireless audio file streaming is certainly possible with an 802.11 AC wireless router, and a gigabit wireless bridge, but we recommend a hard-wired setup to avoid any possible drop-out issues.

- Network Isolators are sometimes used, but just keep in mind that some do drop the bandwidth down from Gigabit speed. There are a few available that are gigabit speed.

- Different types of mobile devices can be used not just Apple, but different controllers are available for different mobile operating systems.

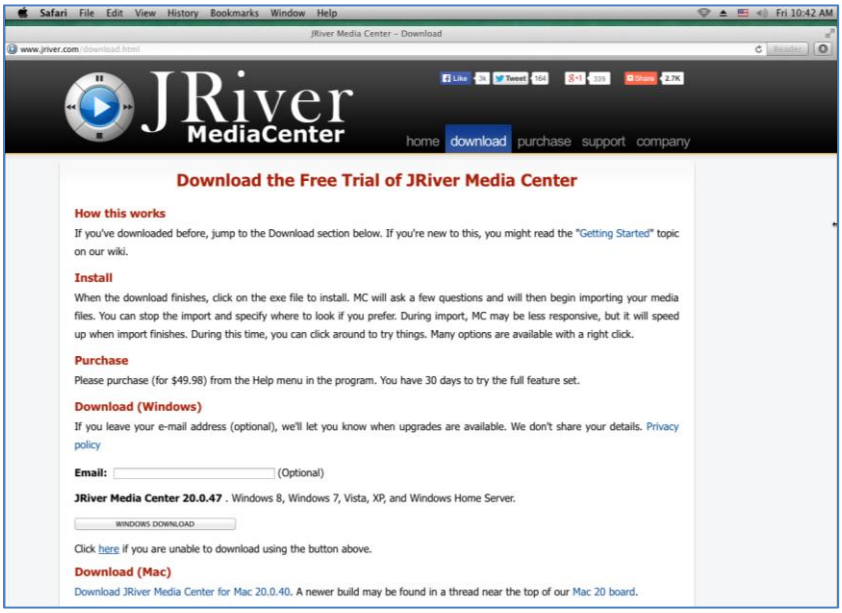
- Different operating system versions for both Apple and Windows will work as well.

6.4 Jriver Media Center Setup

Step 1. Download Jriver Media Center

Open up your Internet Browser and navigate to the following URL:

- http://www.jriver.com/download.html


JRiver MediaCenter
home download purchase support company
Download the Free Trial of JRiver Media Center
How this works
If you've downloaded before, jump to the Download section below. If you're new to this, you might read the "Getting Started" topic on our wiki.
Install
When the download finishes, click on the exe file to install. MC will ask a few questions and will then begin importing your media files. You can stop the import and specify where to look if you prefer. During import, MC may be less responsive, but it will speed up when import finishes. During this time, you can click around to try things. Many options are available with a right click.
Purchase
Please purchase (for $49.98) from the Help menu in the program. You have 30 days to try the full feature set.
Download (Windows)
If you leave your e-mail address (optional), we'll let you know when upgrades are available. We don't share your details. Privacy policy
Email: (Optional)
JRiver Media Center 20.0.47 . Windows 8, Windows 7, Vista, XP, and Windows Home Server.
WINDOWS DOWNLOAD
Click here if you are unable to download using the button above.
Download (Mac)
Download JRiver Media Center for Mac 20.0.40. A newer build may be found in a thread near the top of our Mac 20 board.

Download the correct version for your Operating System (OS):

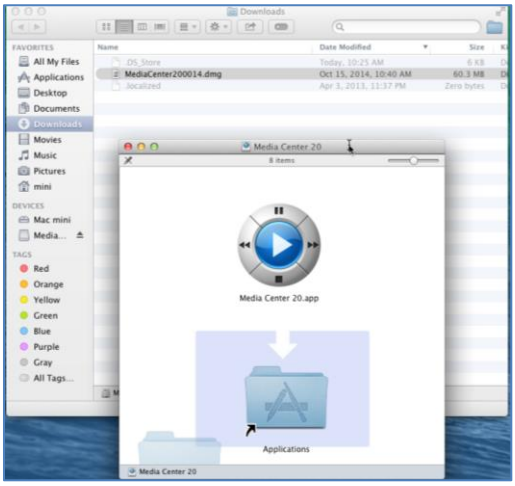
- The **Download (Windows)** section has a Windows Download button for the **EXE** installation file
- The **Download (Mac)** section has a hyperlink to download the **DMG** installation file

A 30 day free trial is available after which you will have to purchase a license from Jriver.

The installation file will initially be found in your Downloads folder after the download is complete.

Step 2. Install Jriver Media Center

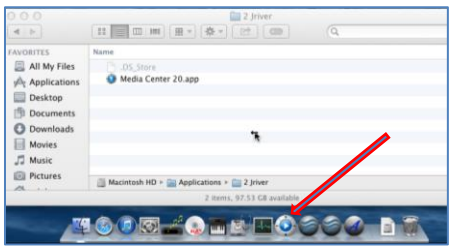
- **For Macintosh:** Double click on the *MediaCenterXX.dmg* (XX denotes the JRMC version) installation package and follow the instructions for installing it on your Mac. This includes agreeing to the license and copying the *Media Center XX.app* into your Applications folder.



- **For Windows:** Double click on the *MediaCenterXX.exe* (XX denotes the JRMC version) installation executable file, wait for the extraction process to complete and follow the instructions for installing it on your PC, which includes agreeing to the license.

Step 3. Open Jriver Media Center (JRMC)

For Macintosh: In your Applications folder double click on the *Media Center XX.app* to start JRMC. Note: For ease of use you can always add the application to your Dashboard.

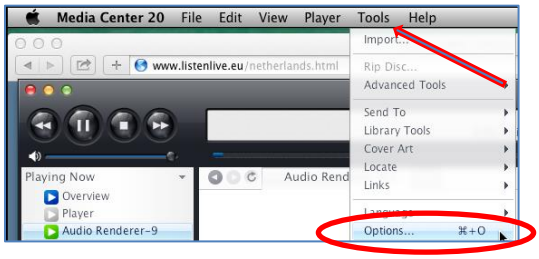


For Windows: On your desktop, double click on the shortcut that was installed initially in order to start Jriver Media Center.

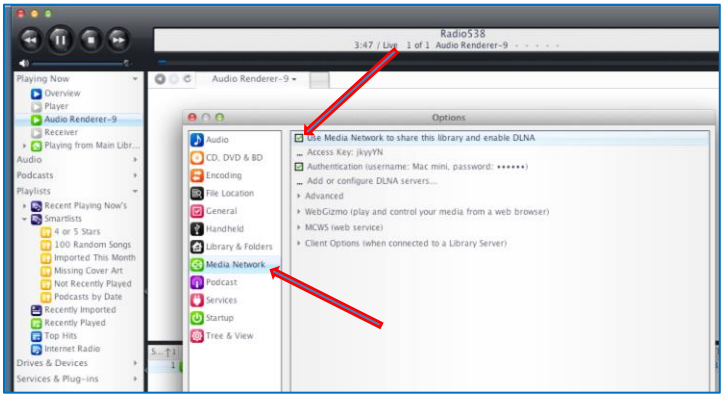
Step 4. Complete DLNA Setups for Jriver Media Center (JRMC)

There is much functionality available within JRMC with many setup screens, but we will only focus on those needed for optimal playback with the MSB Renderer. These are one time setups only needed the first time you use JRMC with the MSB Renderer.

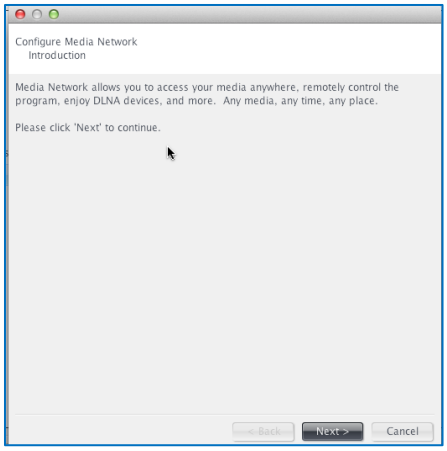
1. Navigate to Tools → Options



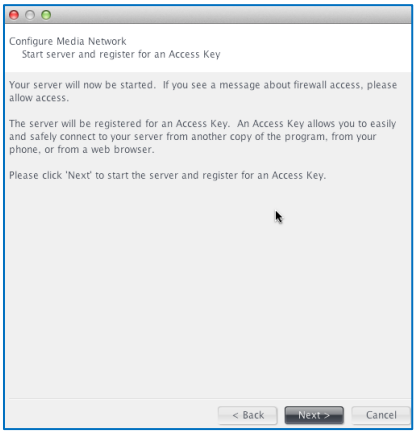
2. From the Options menu left panel select Media Network. Check the box next to the "**Use Media Network to share this library and enable DLNA**" option.



3. The following pop-up window will appear. Just click **Next.**

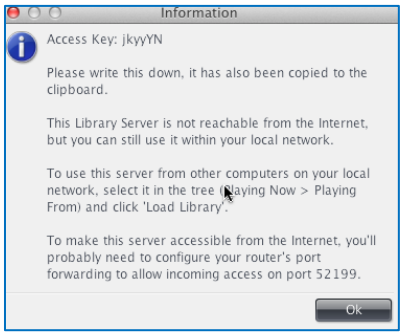

Configure Media Network
Introduction
Media Network allows you to access your media anywhere, remotely control the program, enjoy DLNA devices, and more. Any media, any time, any place.
Please click 'Next' to continue.
< Back
Next >
Cancel

4. The following pop-up window will appear. Just click **Next.**

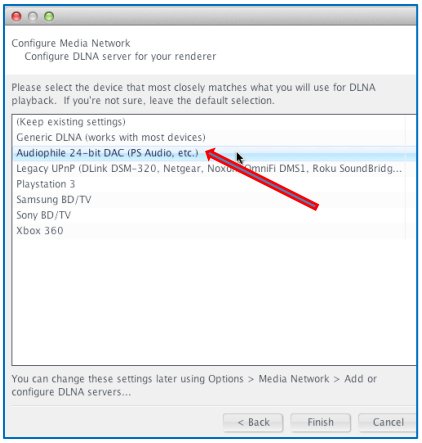

Configure Media Network
Start server and register for an Access Key
Your server will now be started. If you see a message about firewall access, please allow access.
The server will be registered for an Access Key. An Access Key allows you to easily and safely connect to your server from another copy of the program, from your phone, or from a web browser.
Please click 'Next' to start the server and register for an Access Key.
< Back
Next >
Cancel

5. In order to provide a secure and easy way to link the remote controller application **Jremote** with JRMC, an Access Key is provided.
Important: Please write down the code for the JRemote setup step later on. You can always come back to the Options → Media Network screen to find it.

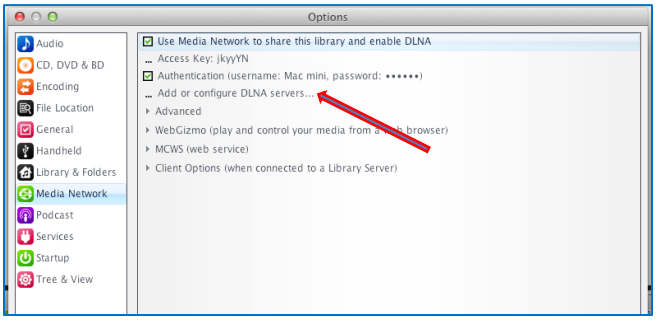
   Click **Ok**.


Information
Access Key: jkyyYN
Please write this down, it has also been copied to the clipboard.
This Library Server is not reachable from the Internet, but you can still use it within your local network.
To use this server from other computers on your local network, select it in the tree (Playing Now > Playing From) and click 'Load Library'.
To make this server accessible from the Internet, you'll probably need to configure your router's port forwarding to allow incoming access on port 52199.
Ok

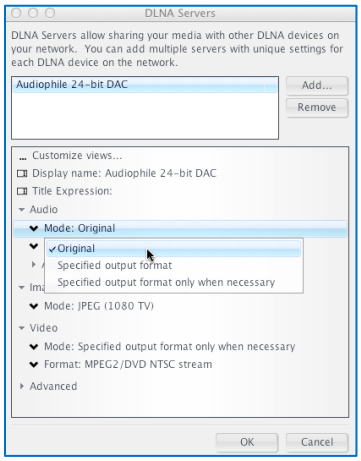
6. Select **Audiophile 24-bit DAC** from the list in the following screen and click **Finish**


Configure Media Network
Configure DLNA server for your renderer
Please select the device that most closely matches what you will use for DLNA playback. If you're not sure, leave the default selection.
(Keep existing settings)
Generic DLNA (works with most devices)
Audiophile 24-bit DAC (PS Audio, etc.)
Playstation 3
Samsung BD/TV
Sony BD/TV
Xbox 360
You can change these settings later using Options > Media Network > Add or configure DLNA servers...
< Back
Finish
Cancel

7. Once back at the Options screen, click on **Add or configure DLNA servers…**

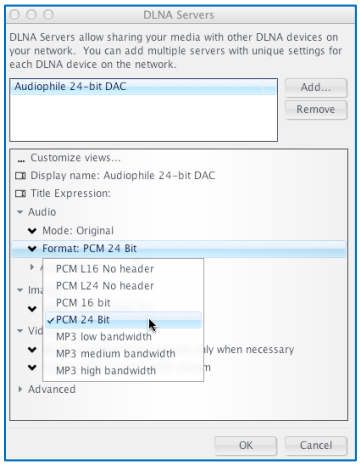


8. In the DLNA Servers page that pops up, navigate to **Audio → Mode** and change to **Mode: Original**.

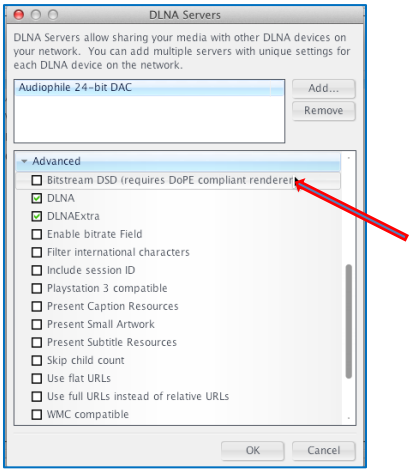


This selection sends the original audio file to the MSB Renderer. If you have files that cannot be played by the MSB Renderer for which transcoding is required you might want to select the other options, but it will no longer be bit-perfect.

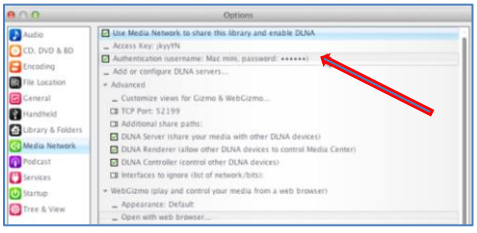
9. Still in the DLNA Servers page, navigate to **Audio → Format** and select to **PCM 24 Bit** for the highest quality.



10. Still in the DLNA Servers page, navigate to **Advanced** and make sure that the checkbox next to "Bitstream DSD (Requires DoPE compliant renderer)" is **Unchecked**. **Click OK**



11. Once back at the Options screen, check the box next to the option Authentication (username: Your Mac Name, password: ●●●●**)**. Add your computer user name and password in the pop up page. **Click OK**



This is to secure your music library when using it with **JRemote** remote control app.

Important: Please write down the username and password for the JRemote setup step later on

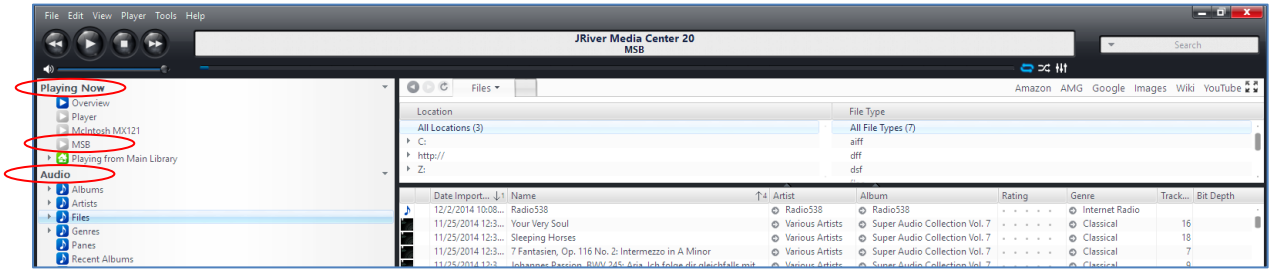
12. **Click OK** to save the Option setting changes and leave the Options screen.

    Congratulations, you have now completed the main JRMC DLNA setup for the MSB Renderer.

Step 5. MSB Renderer Playback from Jriver Media Center (JRMC)

The next step is to have JRMC find the MSB Renderer. When you start JRMC it might take a few moments for JRMC to see the MSB Renderer, but it should show up automatically in the list of "**Playing Now**" devices as **Audio Renderer-X or MSB Tech Renderer–X** (Where X is the last digit of the IP Address given to the MSB Renderer by your router).

1. Optionally, you can right-click on the default Renderer name and rename it if you like.
2. Select the MSB Renderer by clicking **once** on the name within the **Playing Now** section. Now you can go to **Audio** section and select a song to play. It will automatically start playing through the MSB renderer, and the arrow icon next to the Audio Renderer (or what you renamed it to) will turn to green. You can see below that the **Audio Renderer-9** was renamed to **MSB**.



Note: For more details on Jriver Media Center DLNA you can go their help website:

- http://wiki.jriver.com/index.php/DLNA

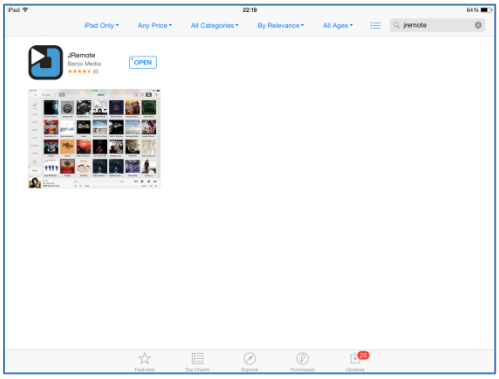
6.5 Jremote Installation

For the remote control we will be using the **Jremote** application on the iPad, which is an excellent way to access and command your music library. Important to note is that Jremote is not an UPnP Controller but it is purely a remote control program for Jriver Media Center only. JRMC can function as the UPnP Media Server ***and*** UPnP Controller at the same time, and it is because of this that gapless and playlist playback with JRMC and Jremote is so smooth.

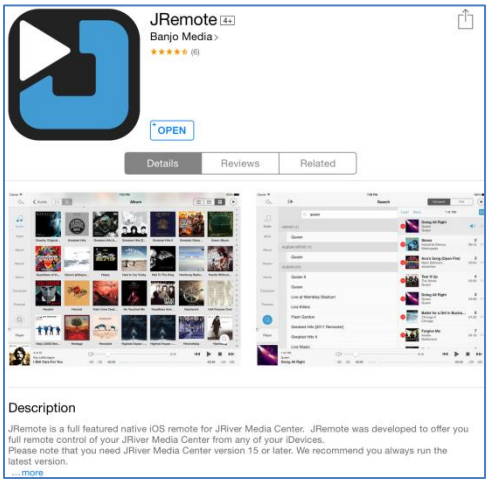
It is not free, and you can of course use any of the other free UPnP Controller applications with Jriver Media Center, but Jremote is tailor-made for JRMC and will be much more user-friendly and stable.

Step 1. Purchase and Install Jremote Application on your iPad

On your iPad open the App Store and search for **Jremote**.

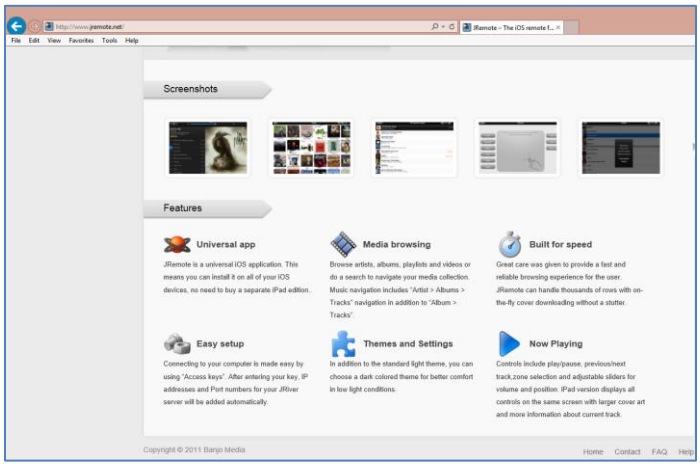


Click on **INSTALL** and follow the instructions to purchase the App.


JRemote
Banjo Media
OPEN
Details
Reviews
Related
Description
JRemote is a full featured native iOS remote for JRiver Media Center. JRemote was developed to offer you full remote control of your JRiver Media Center from any of your iDevices.
Please note that you need JRiver Media Center version 15 or later. We recommend you always run the latest version.
...more

Note: For more details on the Jremote control program for JRMC you can go their help website:

- http://www.jremote.net/

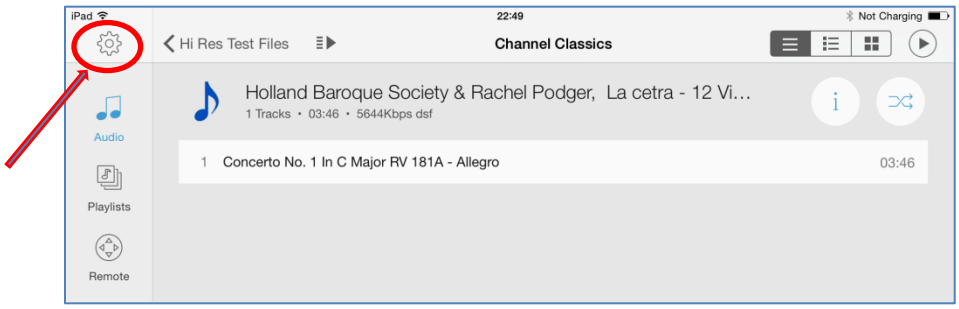


Step 2. Open the JRemote App and Setup

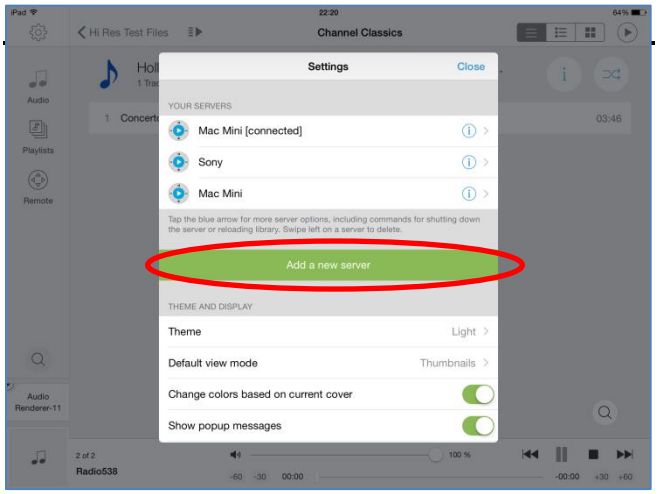
1. Open the Jremote app on the iPad

Note: Make sure your DAC is turned on, JRMC is running and sees the MSB Renderer before starting

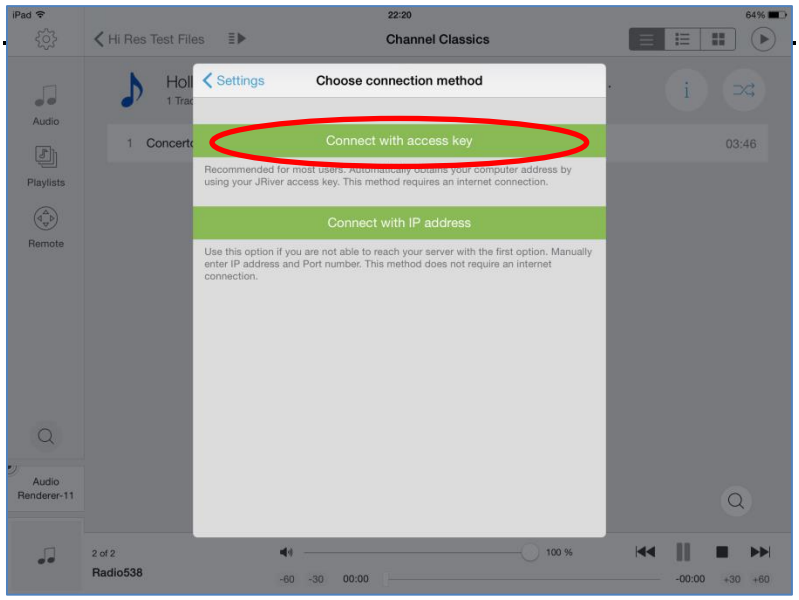
2. Tap on the Settings button in the top left hand corner



3. Tap on **Add a new server**. We need to have JRemote find and link securely to the Jriver Media Center server.



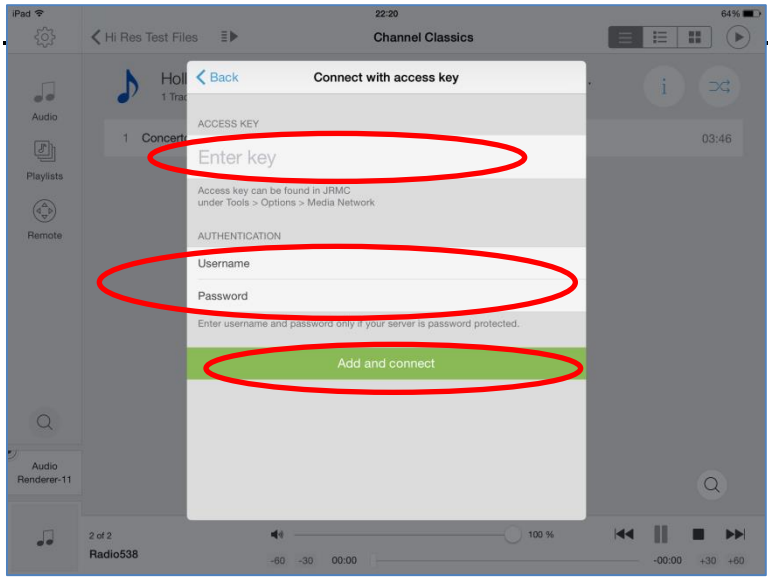
4. There are two ways to add a JRMC server, either using the Access Key which you noted down earlier in the JRMC installation, or using an IP address. The easiest and quickest way is to use the Access Key. Tap on **Connect with access key.**


Hi Res Test Files
Channel Classics
Settings
Choose connection method
Connect with access key
Recommended for most users. Automatically obtains your computer address by using your JRiver access key. This method requires an internet connection.
Connect with IP address
Use this option if you are not able to reach your server with the first option. Manually enter IP address and Port number. This method does not require an internet connection.
Audio
Playlists
Remote
Audio Renderer-11
Radio538

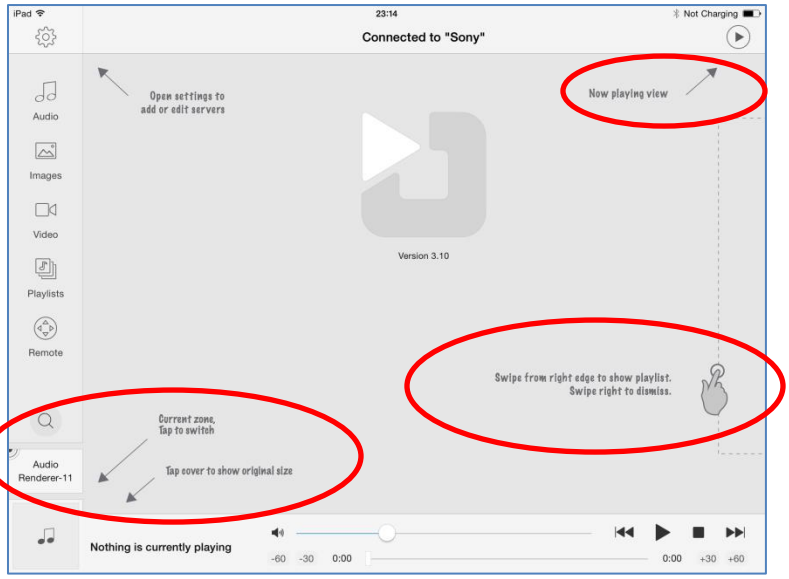
5. Enter the JRMC **Access Key** provided by JRMC in the allocated field

6. Enter the **Username** and **Password** of the computer running the JRMC server. This is the Username and Password that you entered during the JRMC install earlier

7. Tap **Add and connect**. Follow any additional prompts until you are back at the main screen.

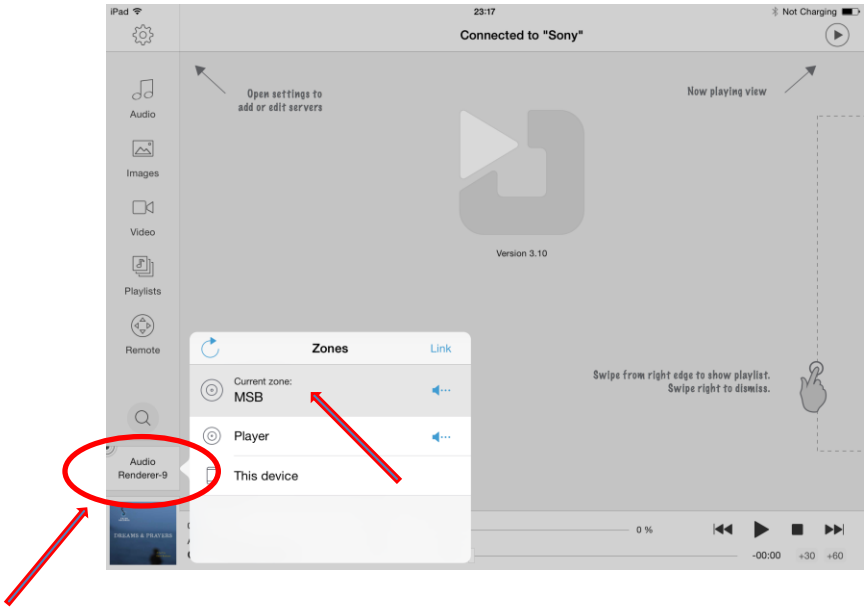


At the main screen you can see handy hint messages are setup for your use.

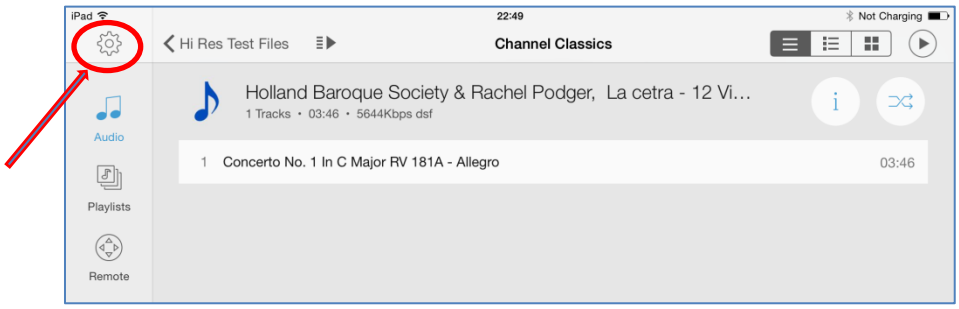


8. Tap on the **Current Zone** button in the bottom left of the screen to view and select the Renderer. It will show as Audio Renderer X (Where X is the last digit of the IP Address given to the MSB Renderer) or the name you had changed it to within JRMC. In this example the MSB Renderer was renamed to **MSB**, and your current zone will be the renderer currently selected for playback.

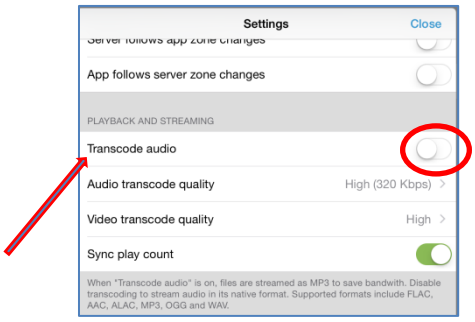
9. Select the renderer by tapping on it.



10. Tap on the Settings button in the top left hand corner again for one final setting change

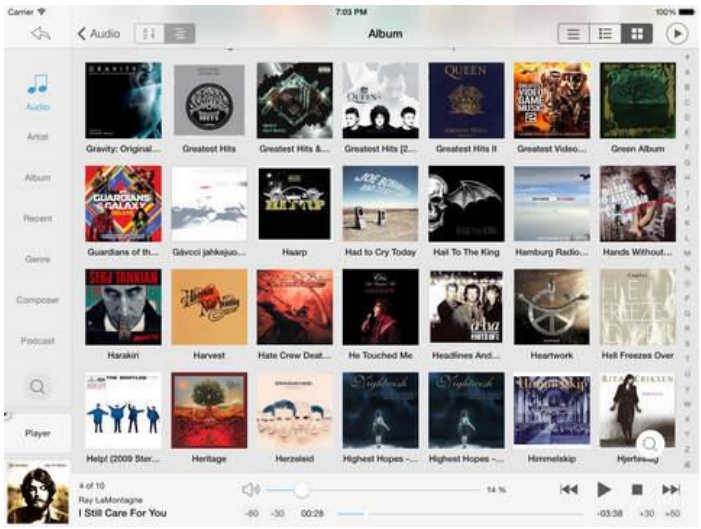


11. Scroll down to **Transcode audio** settings and unselect this option. This is to make sure you are not accidentally transcoding audio. If you are using the iPad as the playback device, you might need to change this setting back.


Settings
Close
App follows server zone changes
PLAYBACK AND STREAMING
Transcode audio
Audio transcode quality
High (320 Kbps)
Video transcode quality
High
Sync play count
When "Transcode audio" is on, files are streamed as MP3 to save bandwith. Disable transcoding to stream audio in its native format. Supported formats include FLAC, AAC, ALAC, MP3, OGG and WAV.

12. You are now ready to enjoy your music library by accessing it remotely using the Jremote App on the iPad as the remote control.

    Tap on the **Audio** button in the top left hand corner to access your library.



    There are a few other settings and functionality that you will be able to discover with Jremote, but this should get you started. For more Jremote details, the following website is also very helpful:

- http://www.computeraudiophile.com/content/478-jremote-ios-remote-jriver-media-center-review/

6.6 Internet Radio on JRMC

Internet Radio is a great way to listen to streaming audio. Using JRMC it is relatively easy to access an internet radio station and set it up as a Playlist for future use. Below are the steps to follow once you know the URL of your radio station.

Step 1. Find the URL of your radio station

The easiest way is to use google to find the radio station URL. There are a few different playback formats, and not always are the URLs made readily available, nor do they always work. A bit of trial and error is required to find the correct URL. Luckily there are a few websites available that have collected many of the popular URLs.

For example:

- http://wiki.slimdevices.com/index.php/Internet_radio_URLs
- http://www.mikesradioworld.com/
- http://www.shoutcast.com/

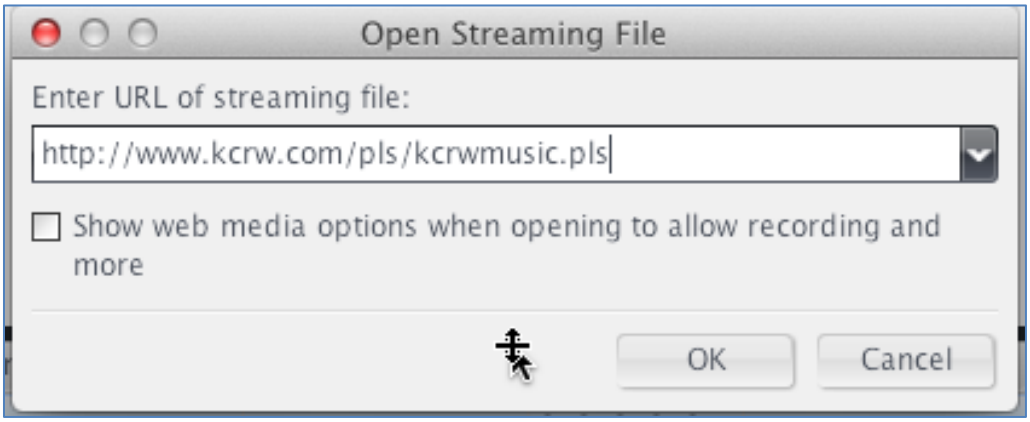
More information can be found on Jriver's website as well:

http://wiki.jriver.com/index.php/Web_Media_(Radio)

Step 2. Open the Internet Radio Station's URL in JRMC

1. Make sure the MSB Renderer is selected by clicking on once on the name within the **Playing Now** section in the top left hand corner
2. Navigate to the menu bar and select **File → Open URL**

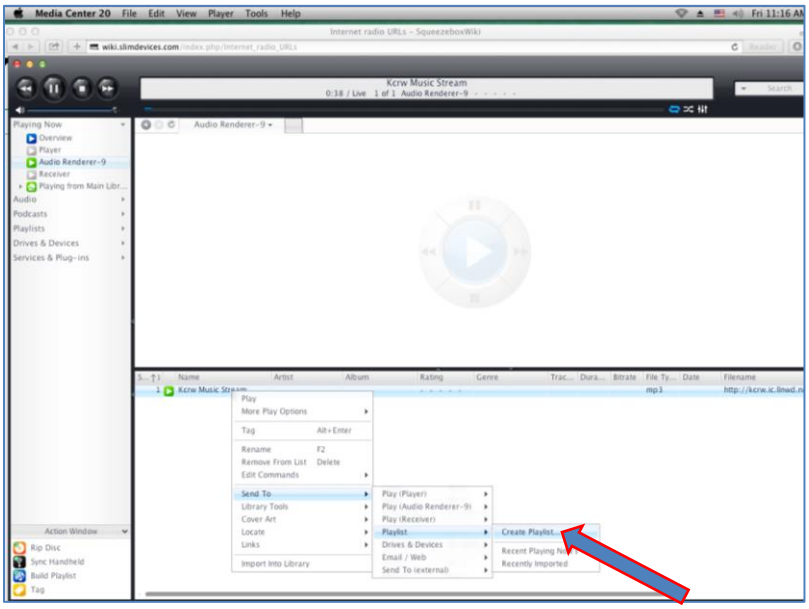
3. Enter or Copy-Paste the URL of the internet radio station in the pop-up screen. Click **OK**



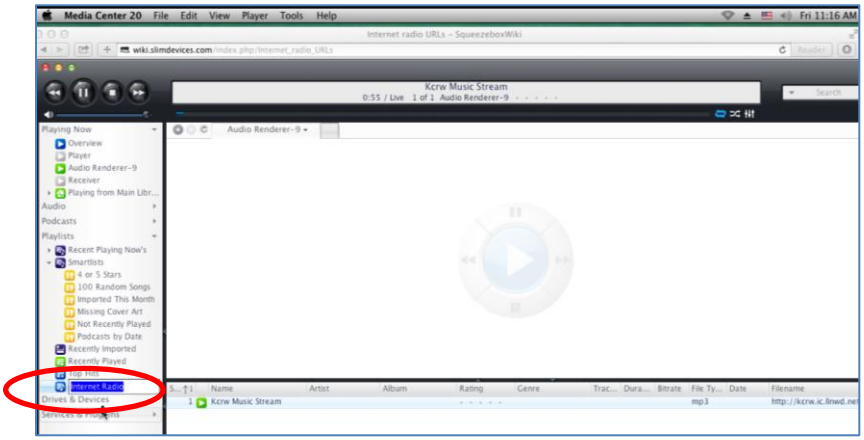
4. In this example the KCRW radio station will start playing in JRMC through the MSB Renderer.
5. You can always rename the radio station to something more user friendly by Right-clicking and selecting Rename.

Step 3. Create an Internet Radio Station Playlist in JRMC

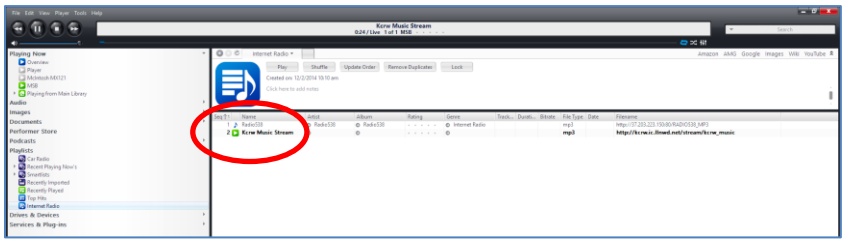
6. To be able to easily find it next time, you can create a Playlist for the Internet Radio station. Right-click on the radio station name and navigate to Send To → Playlist → Create Playlist.



7. Rename the Playlist. In this example the Playlist is called Internet Radio. Your radio station will be added to this Playlist.

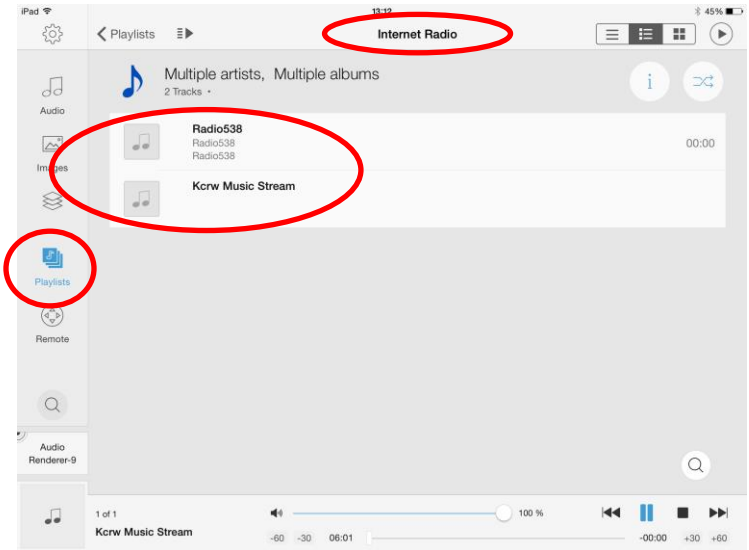


8. Any additional radio station you can now add to this playlist as well in the same manner, by right-clicking on the currently playing radio station and navigating to Send To → Playlist →Internet Radio



9. This playlist will now be visible on the UPnP Controller and JRemote applications and include your Internet Radio stations.

<u>Jremote example:</u>



7. NAS Based Setup Example

A NAS is a Network Attached Storage device, a specialized but easy to use, often Linux based, file sharing computer. The main benefits are that you can place it anywhere in your house, easily expand storage space, is highly reliable, easily maintained, and provides storage that is available to your entire network.

There is a certain simplicity in such a networked audio system once setup. The job of the NAS is to store your audio library files and run the UPnP Server program. This setup does not involve a standard computer in playback, although you will still need one for such tasks as ripping CDs, set up and audio library management.

There are quite a few options of NAS hardware available, but two of the more popular options are by QNAP and Synology.

A NAS usually includes a few UPnP server programs, but some may limit what file types and resolutions can be played. MinimServer is a stable and free UPnP server, and one of the few which can handle both PCM and DSD audio playback.

There are many UPnP controllers that can be used to access and play your music from the NAS. They can be used on most mobile devices even though in the example we are using an Apple iPad. Once setup it is as simple as pointing the Controller to the library on the NAS, selecting the MSB Renderer, and enjoy the playback. The Lightning DS UPnP Controller is a relative newcomer but has much development focus on it still, is one of the better looking ones that can handle gapless playback and is free. Linn Kinsky and PlugPlayer are other popular UPnP Controllers, each with their own look and feel, advantages and disadvantages.

Below we will show you step-by-step how to setup the NAS with **MinimServer** as the UPnP Server, and **Lightning DS** on the iPad as the UPnP Controller, for use with the MSB Renderer. We are not saying that the hardware and software we picked in the examples are better than other brands or options, but these are good options to start with to enjoy your MSB Renderer.

7.1 NAS Based System Example

Hardware and Network Setup

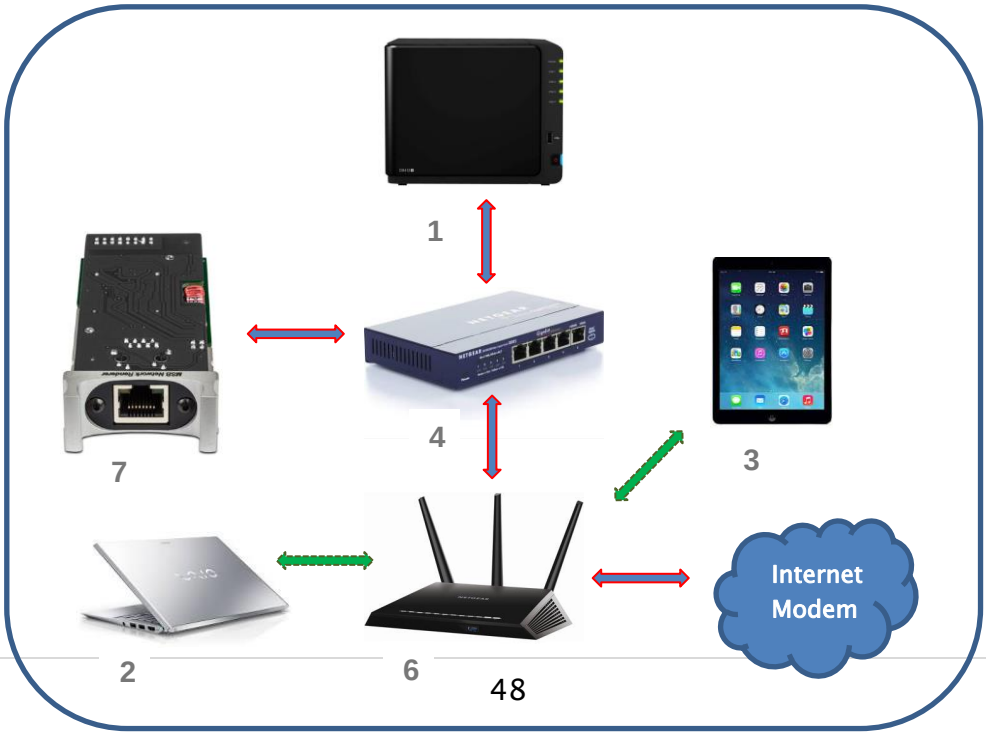
We assume you have already setup and turned on your home network and:

- Your NAS can access the internet and is hard-wired to the home network
- Your wireless device (Pad, Phone, Tablet), which will run the Controller, has access to your network and the internet via WiFi
- You have a computer or laptop on the network that can function in setup tasks
- The MSB Network Renderer is connected to the NAS via a Gigabit switch and is hard-wired with quality Ethernet cables
- Your MSB DAC has the latest firmware, the MSB Renderer module installed in the DAC and is turned on

Hardware used in this example:

1. Synology DS412+ NAS running DSM 5.1 OS and UPnP MinimServer
2. Sony Vaio laptop on Windows 8. Only used for NAS setup activities, not audio purposes.
3. iPad Air with 16GB memory running JRemote connected through WiFi
4. Small gigabit switch from Netgear, the ProSafe GS105
5. Certified Ethernet Cat6a cables from Blue Jeans Cable (Shown as ⟺ in Diagram 4)
6. Netgear Nighthawk AC1750 (R6700) Wireless Dual Band Gigabit Router
7. MSB Network Renderer

Diagram 5: NAS Based Network Audio Example



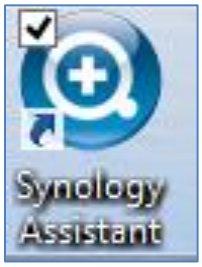
7.2 NAS and UPnP Server Installation

Step 1. Install the NAS

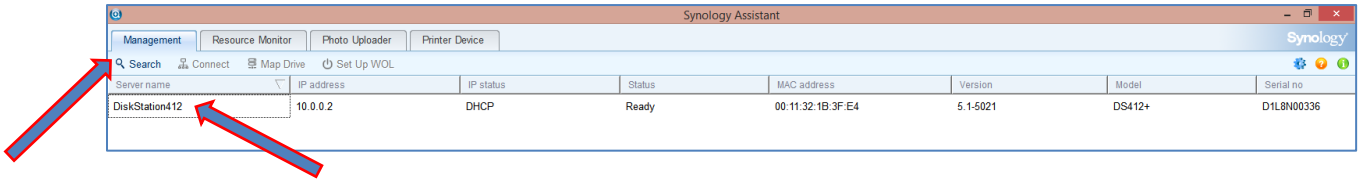
Your NAS will come with an installation manual and a program to access the NAS through a web browser on your computer or laptop for setup and maintenance purposes. Follow the instructions closely and install the software on your computer or laptop. Attach the NAS via quality Ethernet cable to your network. The Synology comes with the Synology Assistant which was installed on the laptop also connected to the network. The laptop is only used for installation and setup purposes and not any audio related streaming activities.

There is much additional functionality the NAS can be used for, but below we will focus only on those setups pertaining to setting it up as a UPnP music file server.

1. Click on the Synology Assistant desktop shortcut that was created during the installation on the laptop.

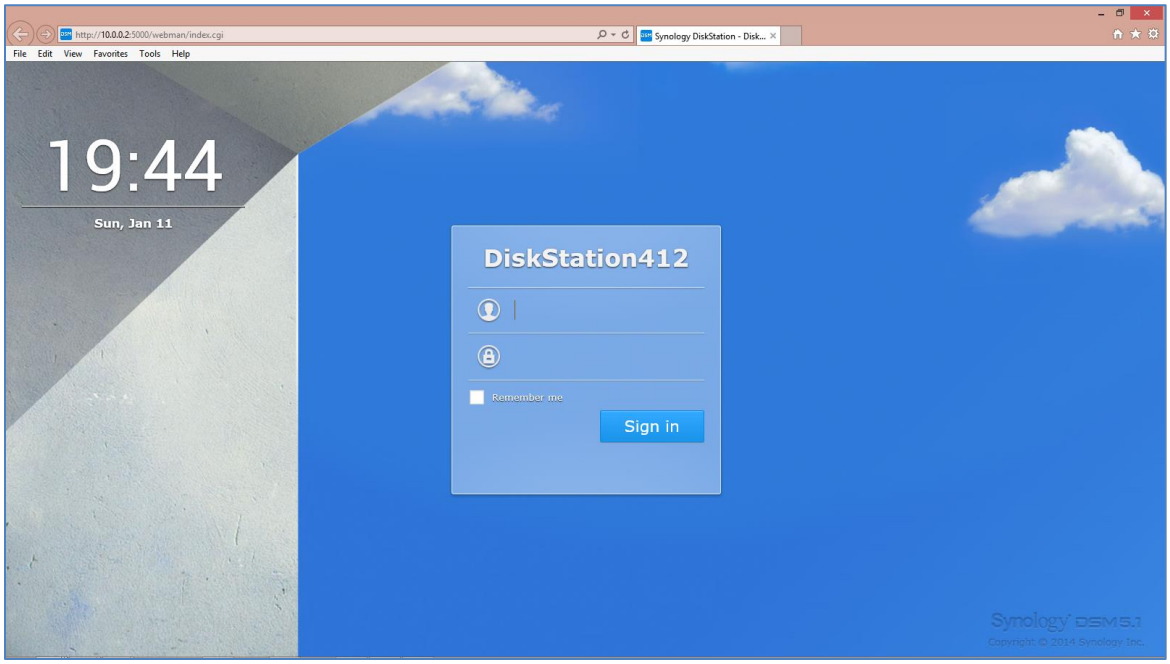


The Synology Assistant will search for your NAS on the network in the Management tab. Just click on the Search button and wait for a few moments.

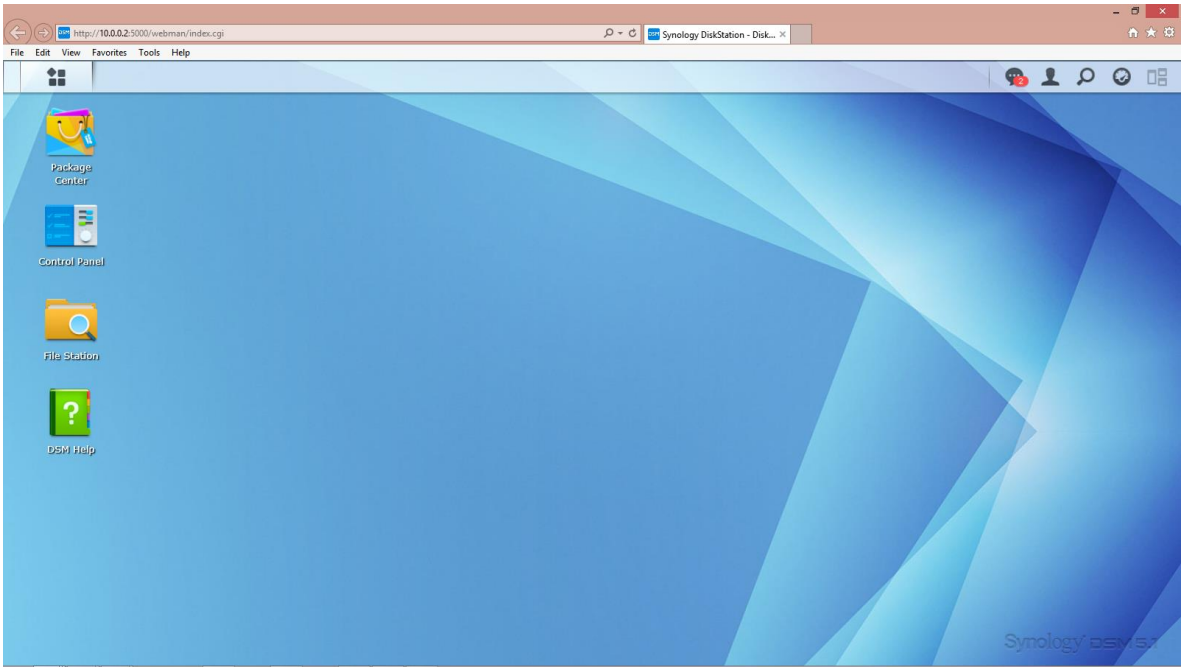


Once found, the NAS will be listed and the status will show **Ready** when it is up and running**.**

2. **Double click** on the Server name: DiskStation412 (the DS412+ NAS). The log in screen will show.
3. Enter the NAS **user name** and **password**. Consult the manual for the initial admin user name and password. You can always change it later.
4. Click on **Sign In**



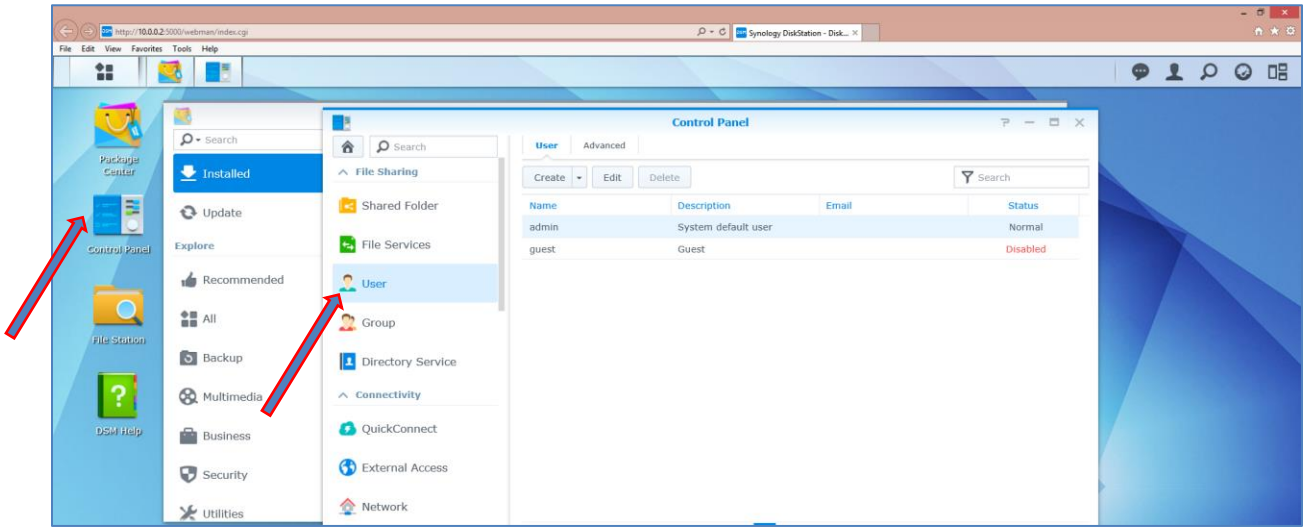
The main desktop of the Synology NAS now shows.



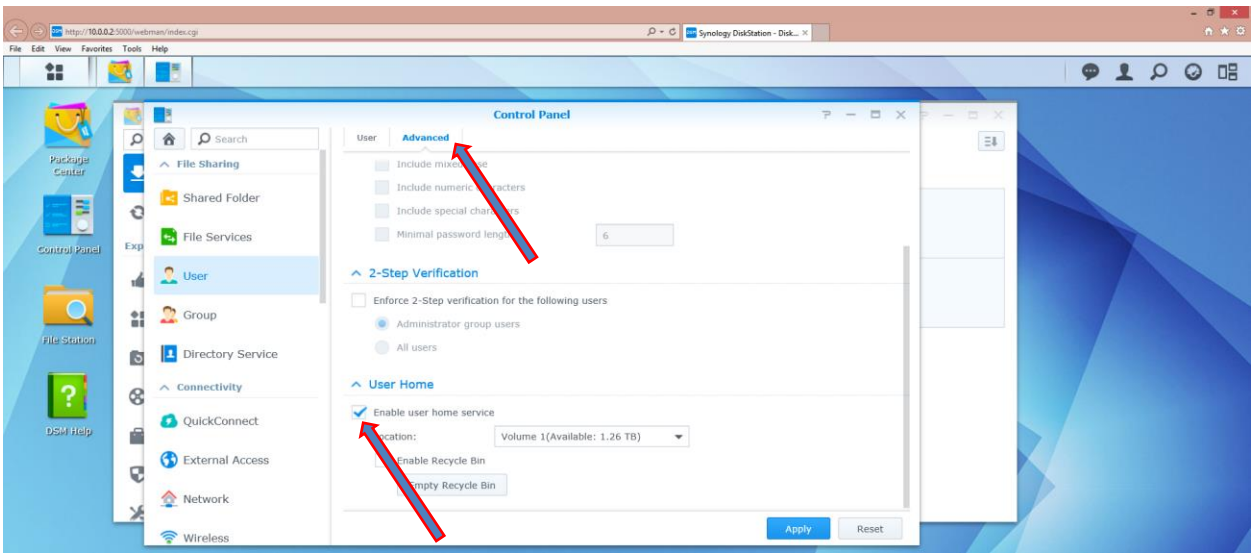
Step 2. Setup File Sharing

The setup is important in being able to access the files on the NAS via the Windows Explorer on your laptop, easily allowing copying, dragging and dropping of files and managing your audio library.

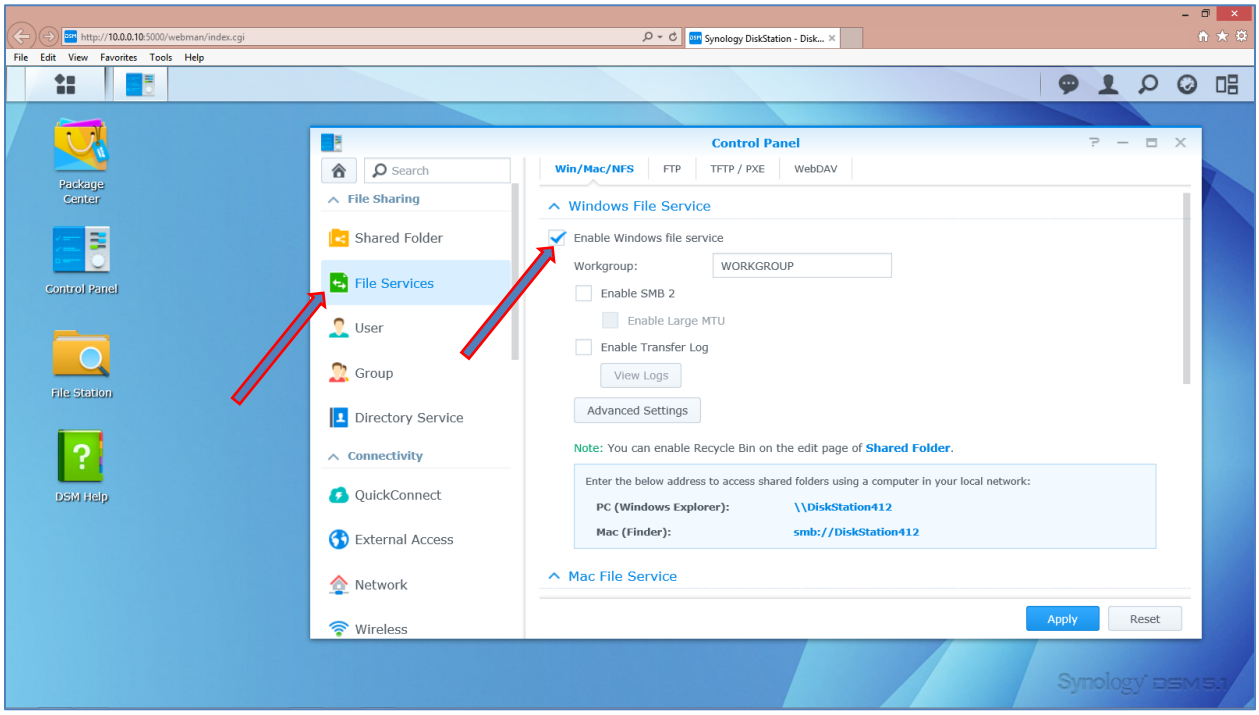
1. Click on the Control Panel icon.
2. Click on User.



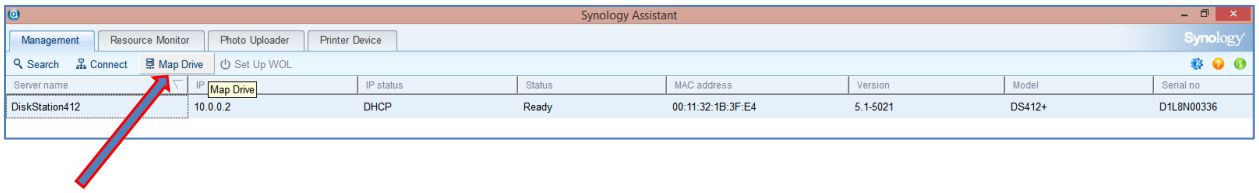
3. Click on the Advance Tab and scroll down to User Home
4. Check the Enable user home service box



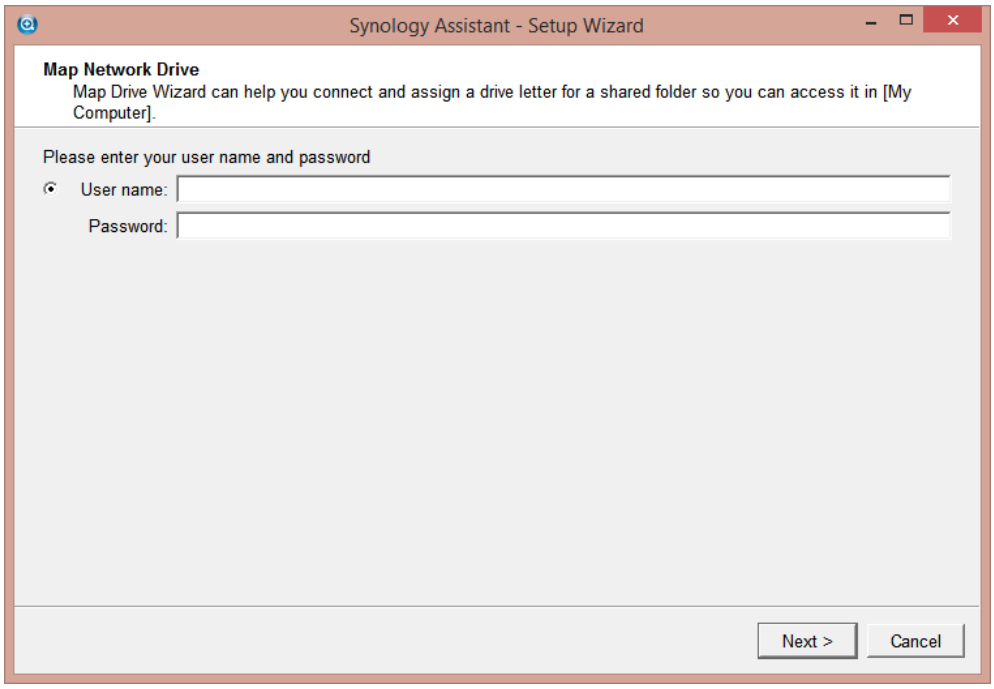
5. Enable Windows File Service by clicking on **File Services** in the **Control Panel. Check** the box for **Enable Windows file service**



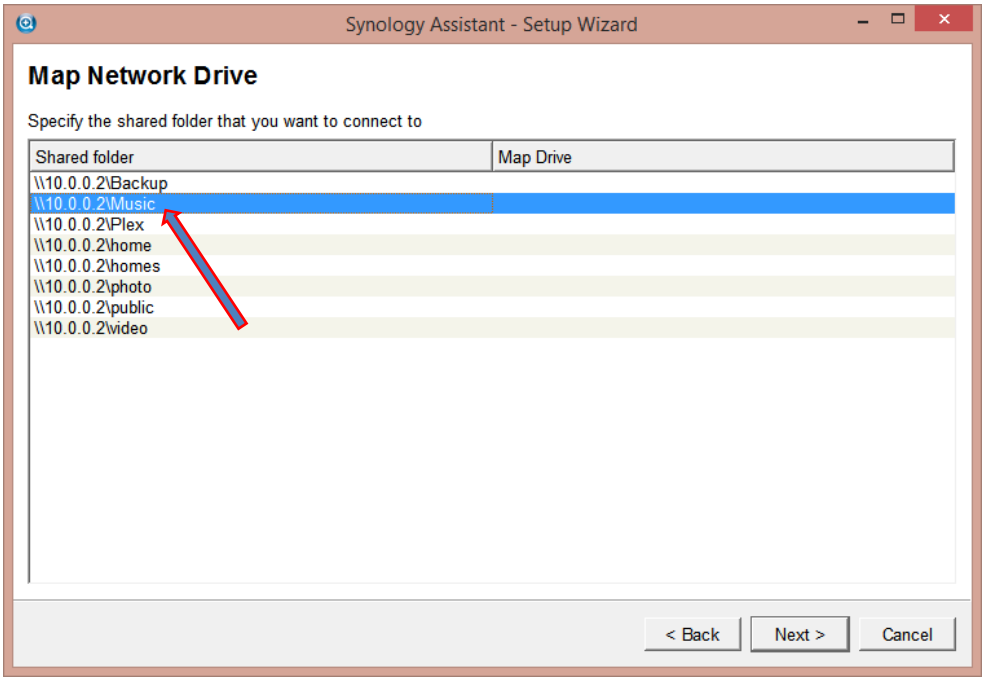
6. Navigate back to the Synology Assistant main screen. Click on the **Map Drive** button on the Management tab.



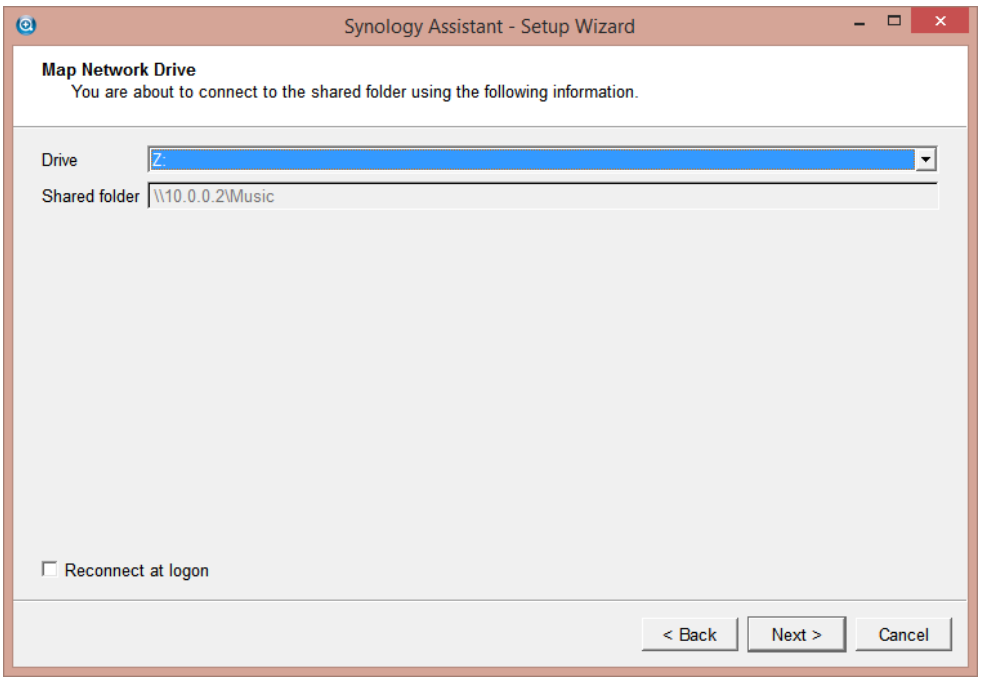
7. A setup wizard will ask for the **user name** and **password** to the Synology NAS. After entering them click **Next**


Synology Assistant - Setup Wizard
Map Network Drive
Map Drive Wizard can help you connect and assign a drive letter for a shared folder so you can access it in [My Computer].
Please enter your user name and password
User name:
Password:
Next >
Cancel

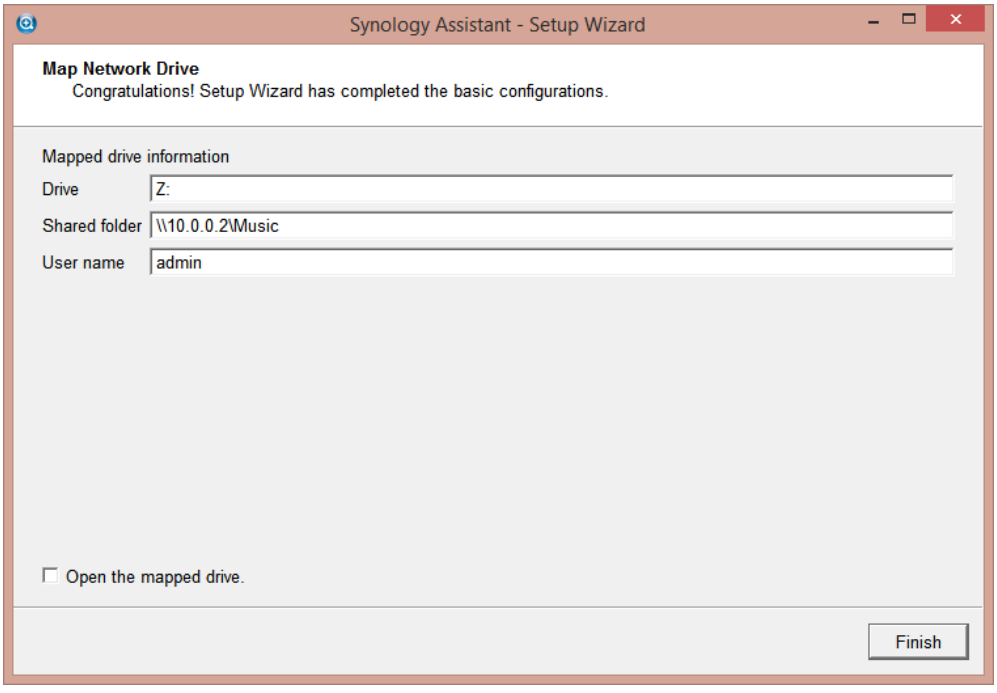
8. Select the **Music** folder from the list. This is where your music files will be stored. It will be preceded with the IP Address given to your NAS. Click **Next**



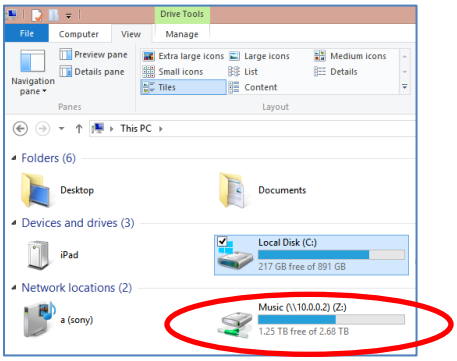
9. Select your choice of **Drive** letter for the Mapped Drive. This is how it will show in Windows Explorer on your laptop. Click **Next**.



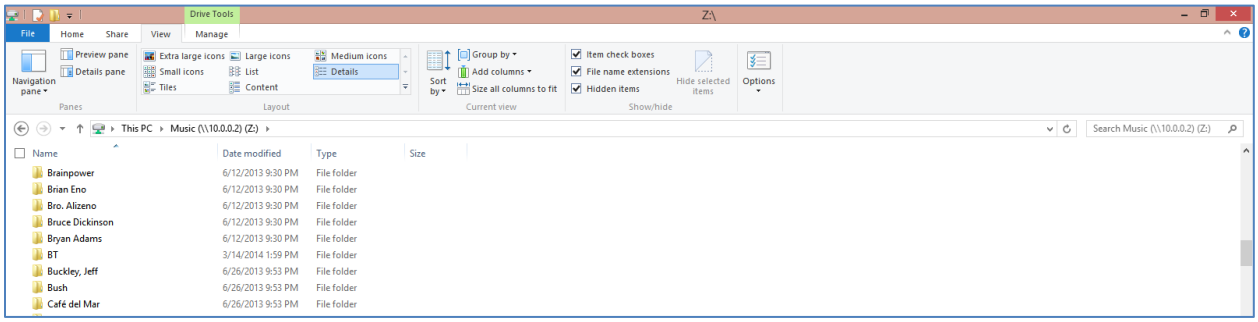
10. Confirm the Mapped Drive setup information. Click **Finish.**



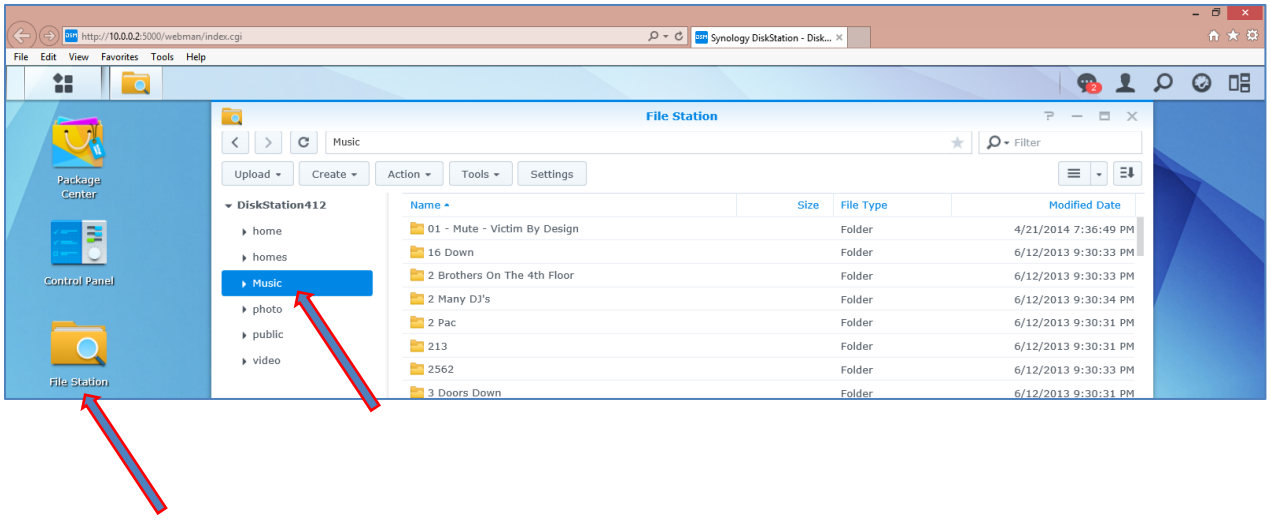
11. The Mapped Drive to your Audio folder on the NAS will now show in Windows Explorer on your laptop.



12. Now you can easily copy your music library into the NAS Music folder and maintain it. Copy a few albums to your NAS for initial testing purposes.



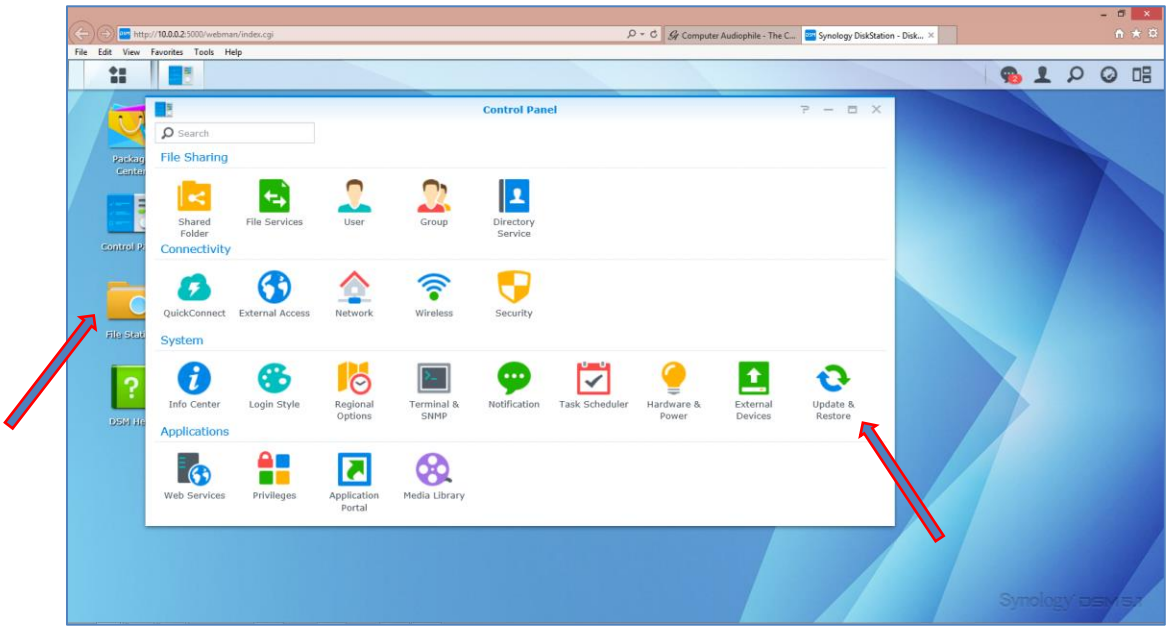
13. On the NAS a similar tool to the Windows Explorer used to browse and update the file structure is called the **File Explorer**. After copying from your laptop to the NAS, the files appear in the Music folder on the NAS.



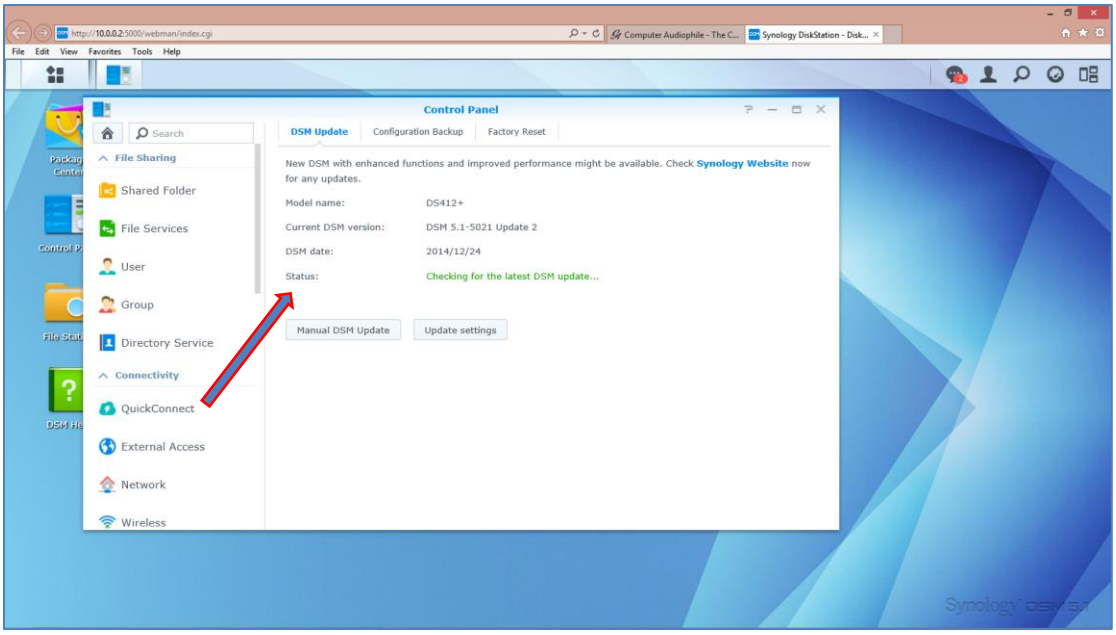
Step 3. Update the Synology Operating System DSM to the latest version

Since you purchased the NAS updates may have been made by Synology for additional functionality, security or bug fixes.

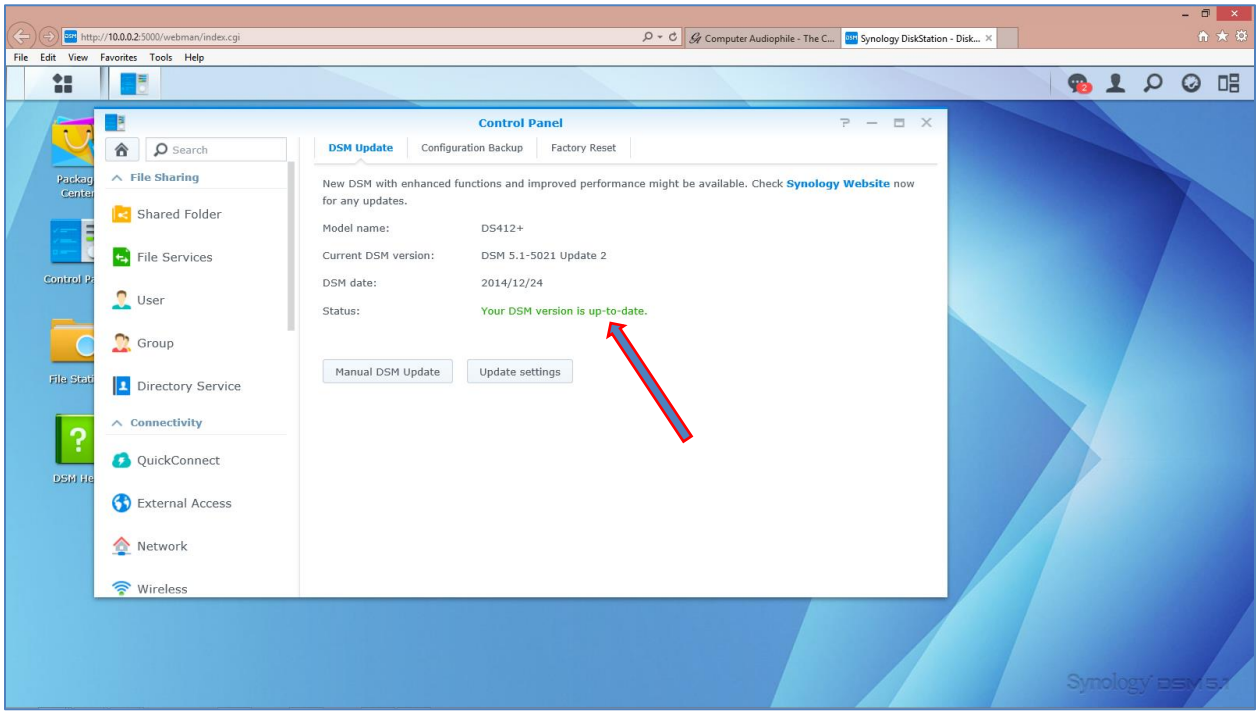
1. On the NAS Desktop Click on the **Control Panel** icon.
2. Click on **Update & Restore**.



3. The NAS will automatically start checking if you have the latest version. You can check the progress in the Status.



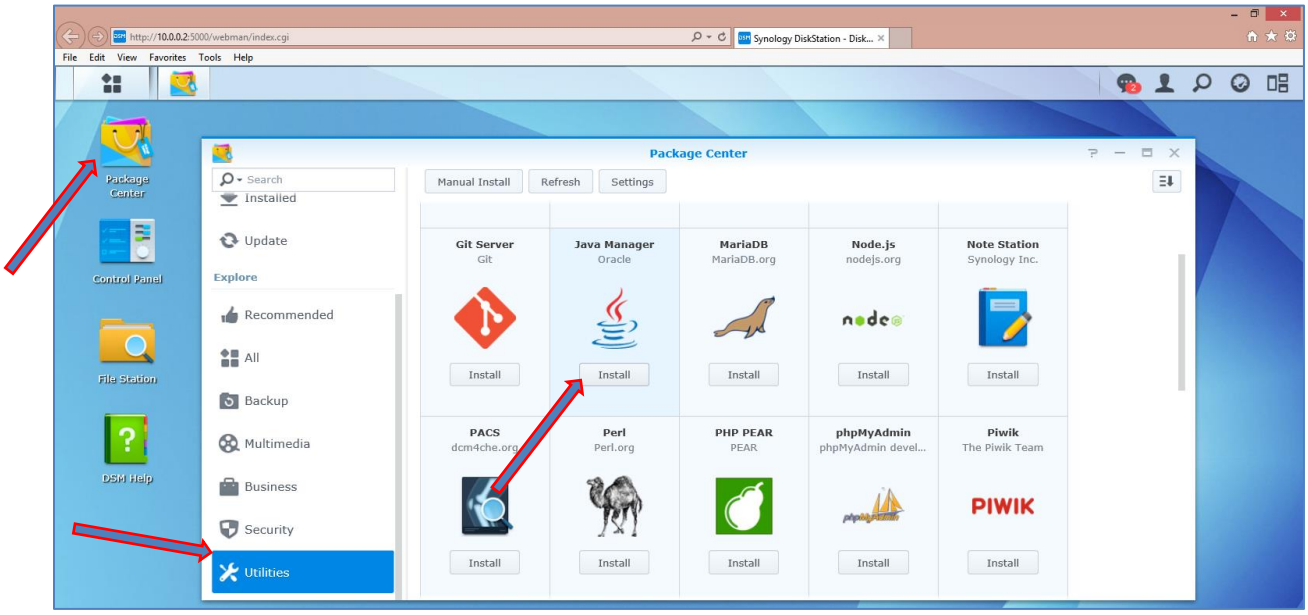
4. If there is an update available, follow the prompts to install Once you are up to date the following up-to-date Status will show.



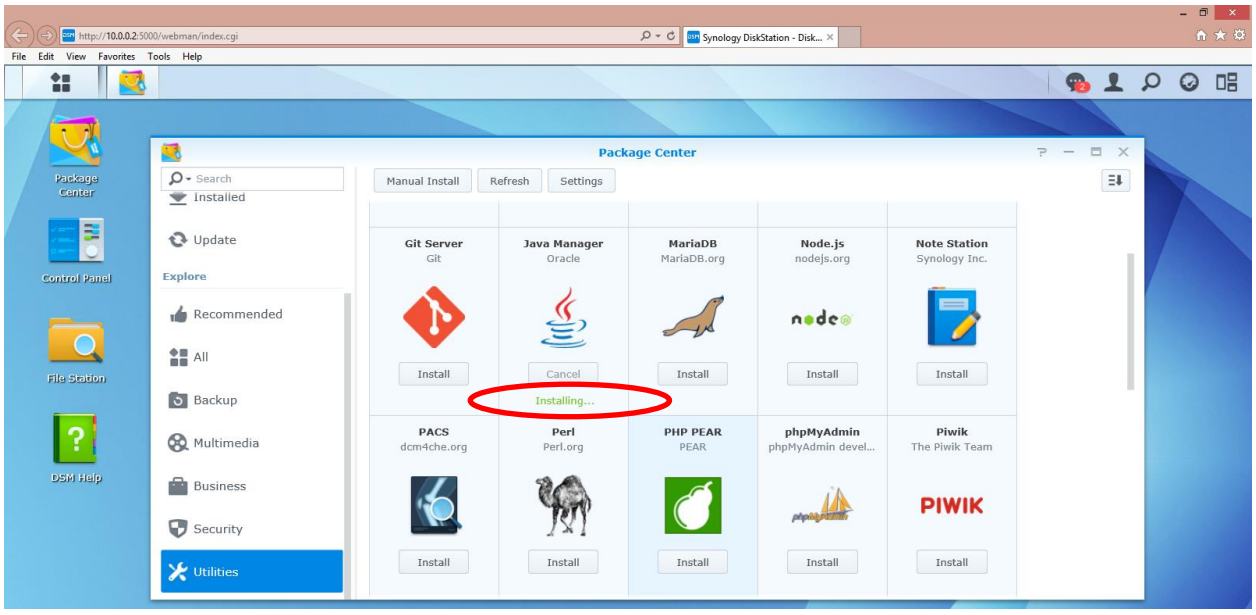
Step 4. Install Java

MinimServer UPnP server requires Java to be running in order to function. The Synology operating system currently only supports version 7 of Java, so do not install the absolute latest from Oracle.

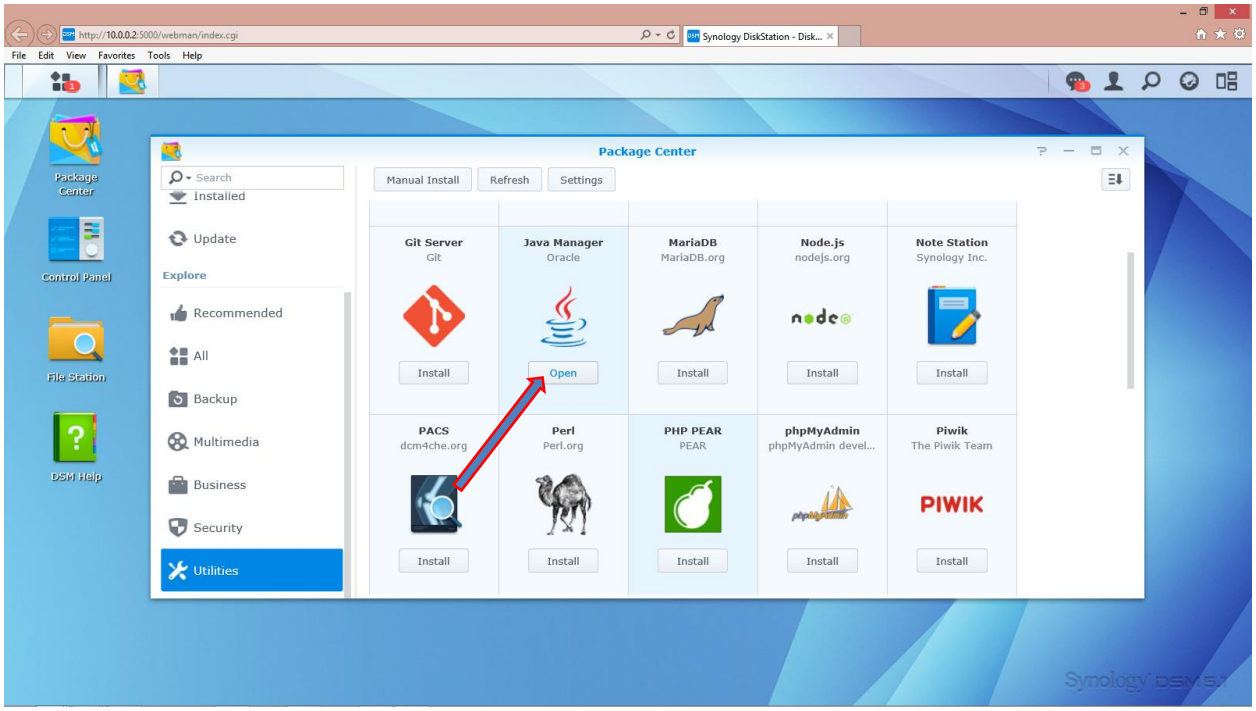
1. On the NAS desktop click on **the Package Center** and select **Utilities** from the Package Center screen. Click on the **Install** button for the **Java Manager** package.



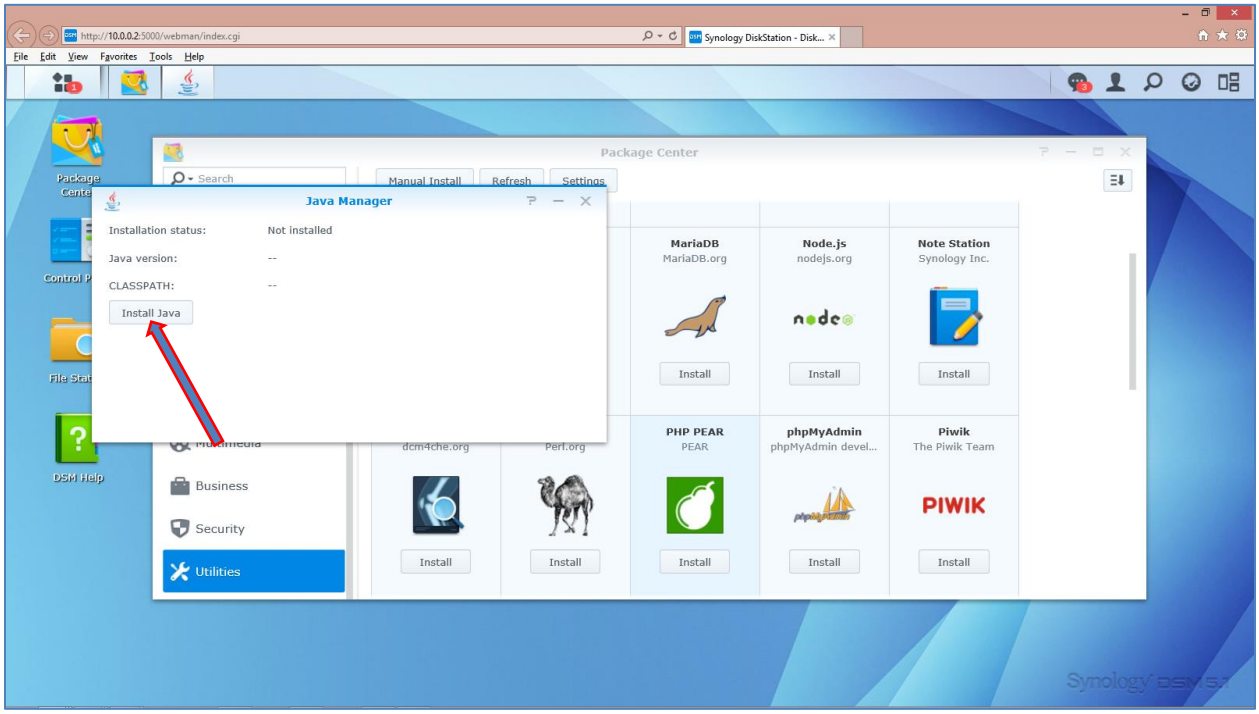
2. Wait for the **Installing** process to complete.



3. Click on the **Open** button.



4. Click on the **Install Java** button in the Java Manager screen

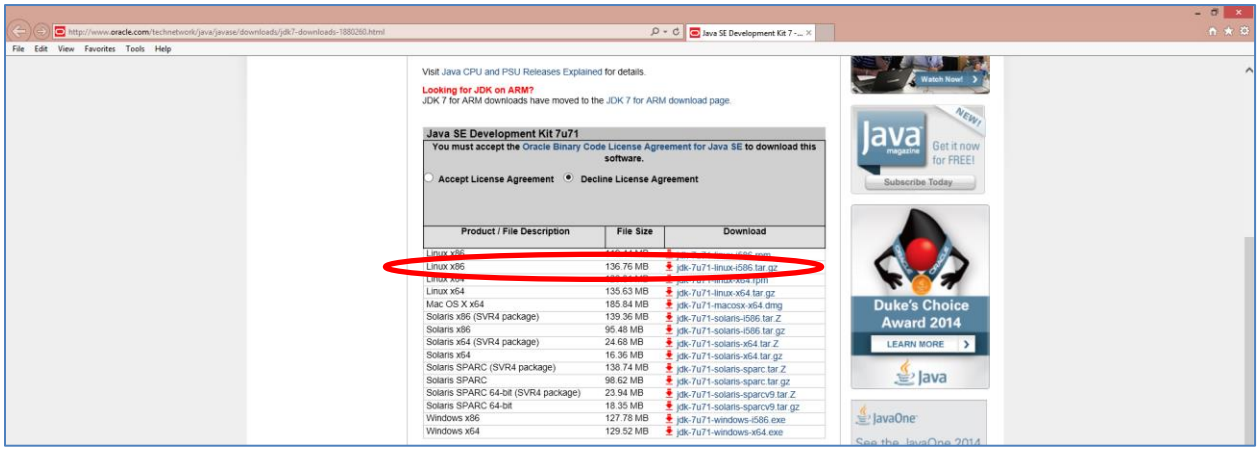


5. Click on the **Java SE Downloads** hyperlink. This will open up your internet browser on your computer, not the NAS, and automatically navigate to the following Oracle website to download Java SE Development Kit 7.

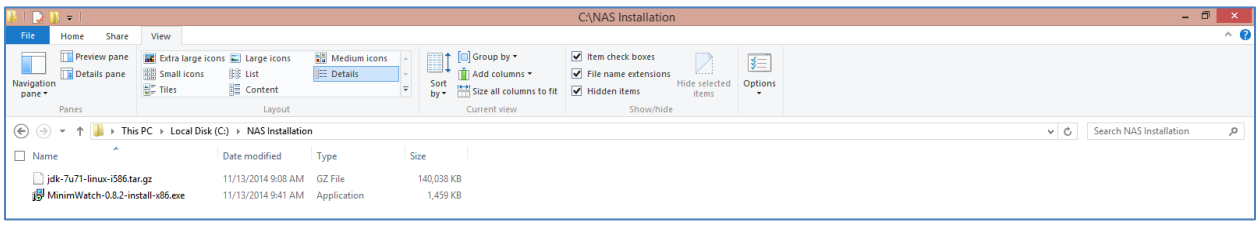
    - http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html

Install Java
Please follow the steps below to install Java:
1. Go to Java SE Downloads.
2. Click JDK's Download button next to Java SE 7 upgrade 51 (DSM currently supports Java 7. The minor version number may be larger than 51).
3. Accept the license agreement and download the Linux x86 version. The file name should be in the format similar to jdk-7u51-linux-i586.tar.gz (The minor version number may be larger than 51).
4. Select the file you have downloaded.
Browse
OK
Cancel

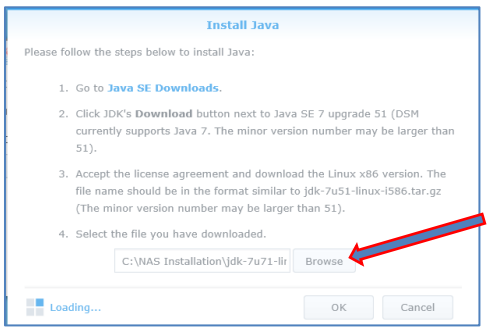
6. Be sure to check which version you need for your specific NAS, click on the Accept License Agreement radio button and click on the download link. In this example we will be using the latest version 7 release available for Linux x86. The installation file is called:
    - jdk-7u71-linux-i586.tar.gz



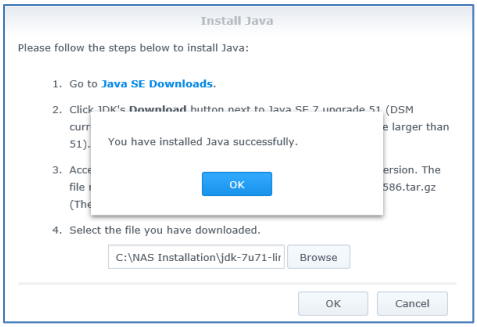
7. Save the installation file to a folder on your computer



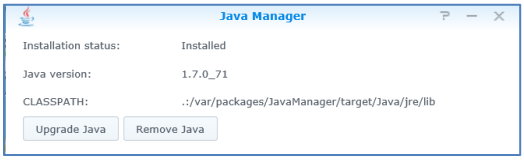
8. Back on the NAS Install Java screen, click on Browse button and select the installation file that you had just saved to a folder on your computer. Click OK.


Install Java
Please follow the steps below to install Java:
1. Go to Java SE Downloads.
2. Click JDK's Download button next to Java SE 7 upgrade 51 (DSM currently supports Java 7. The minor version number may be larger than 51).
3. Accept the license agreement and download the Linux x86 version. The file name should be in the format similar to jdk-7u51-linux-i586.tar.gz (The minor version number may be larger than 51).
4. Select the file you have downloaded.
C:\NAS Installation\jdk-7u71-lir
Browse
Loading...
OK
Cancel

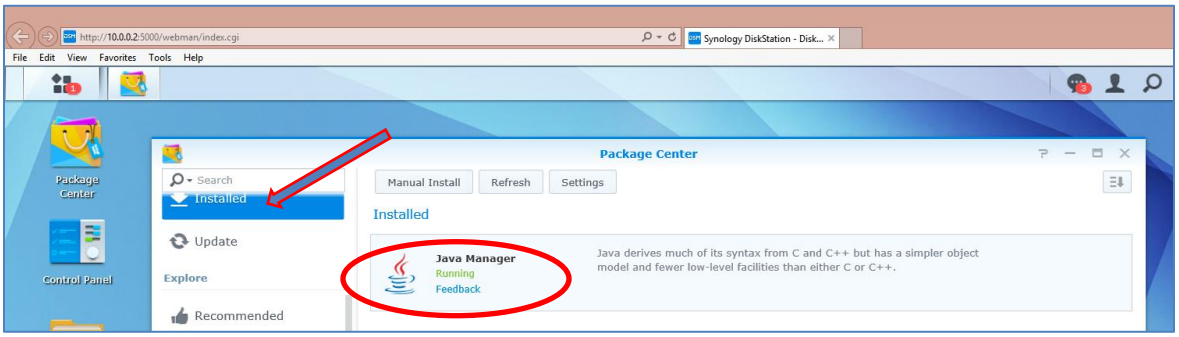
9. Wait a few moments for the installation is complete and you will see the following message. Click OK.



10. Back in the Java Manager screen you will now see installation status is **Installed** with the Java version showing.

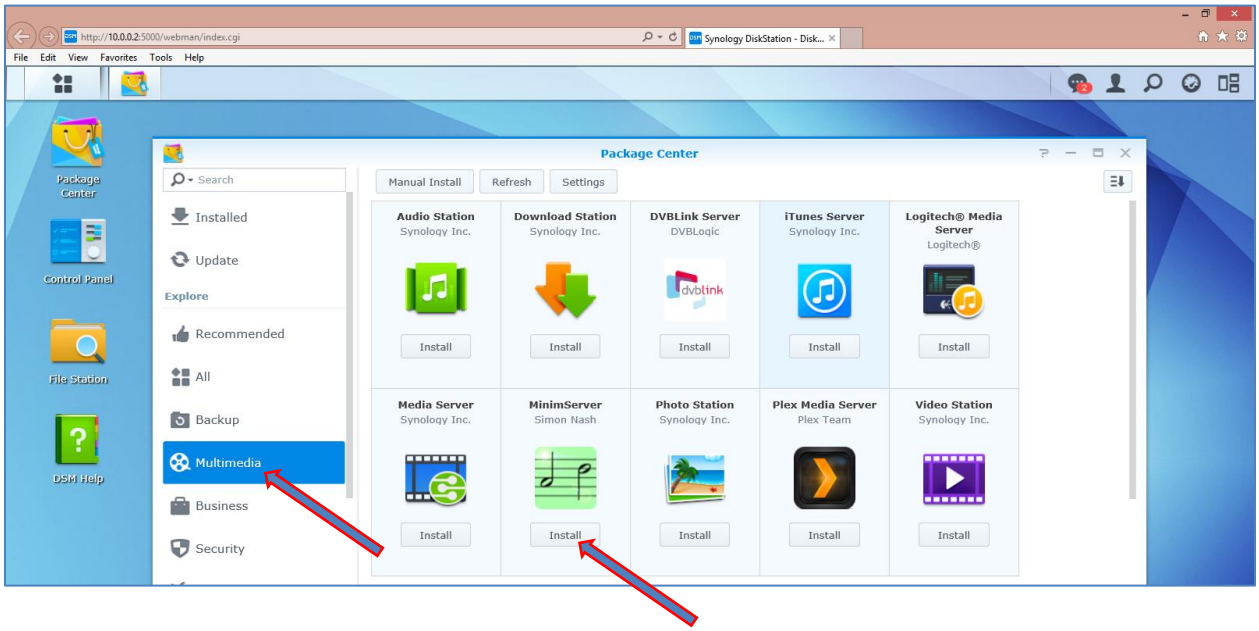


11. Back in the Package Center, if you click on Installed you will now see Java Manager Installed and with the Status of Running

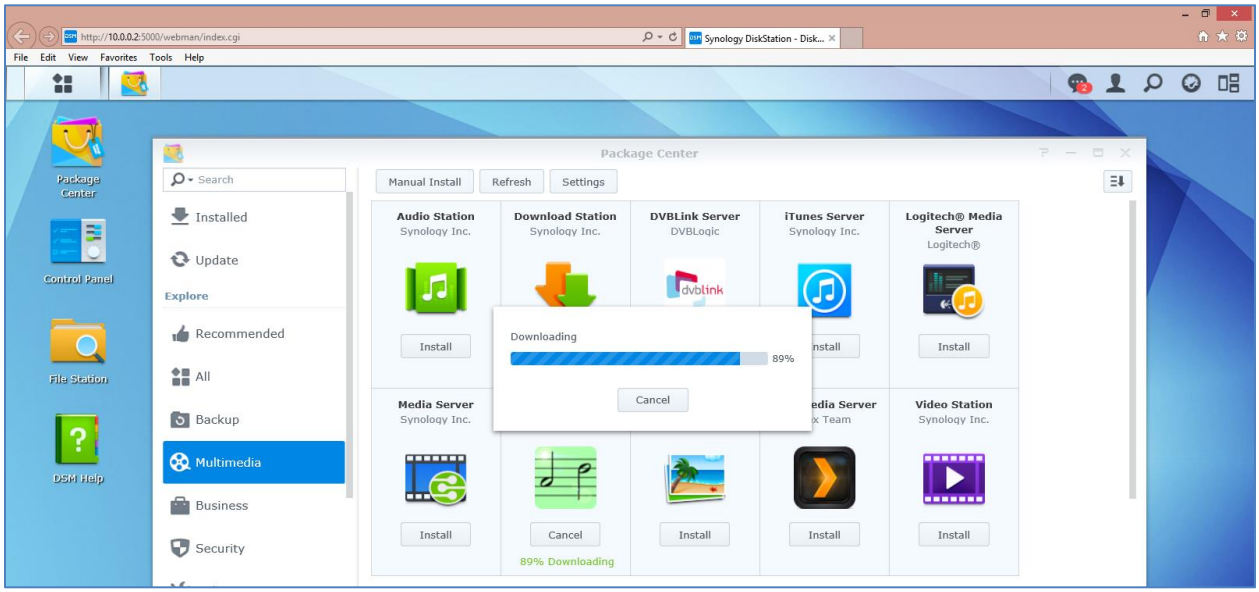


Step 5. Install the UPnP Media Server MinimServer

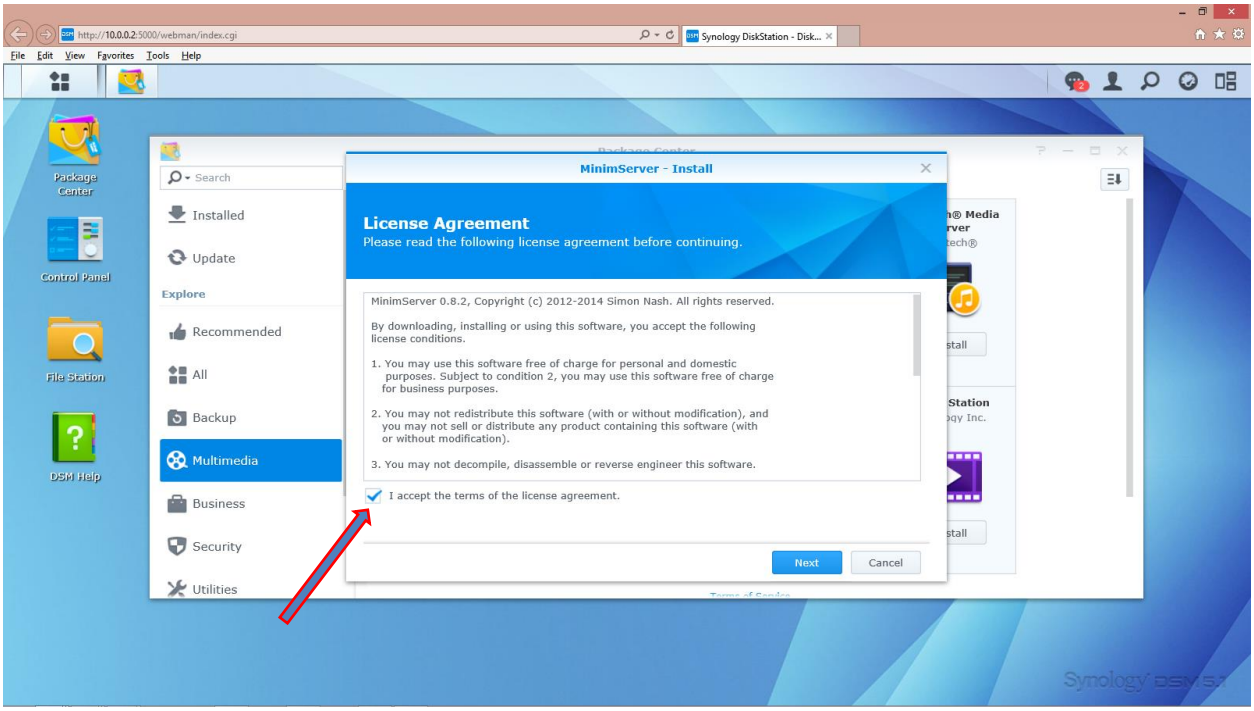
1. The Synology NAS comes with the MinimServer package, but it needs to be installed. On the NAS desktop click on the **Package Center** and select **Multimedia** from the Package Center screen. Click on the **Install** button for the **MinimServer** package.



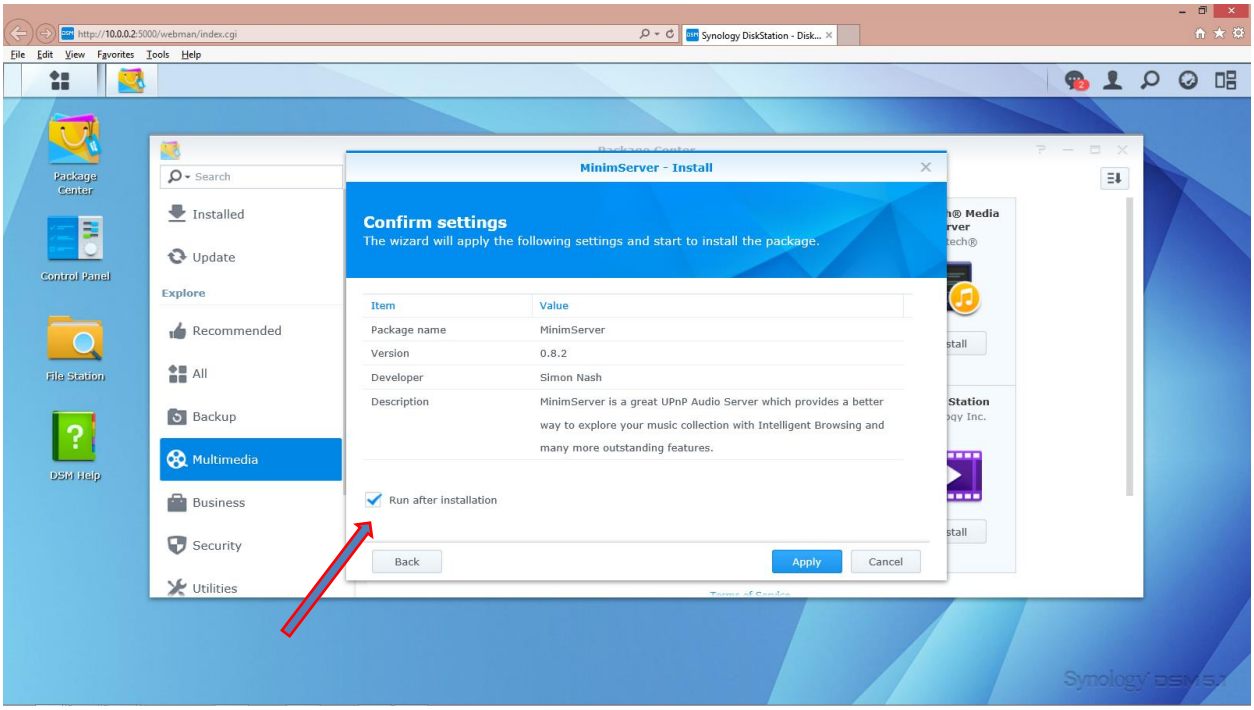
2. Wait for the **Downloading** and **Installation** process to complete.



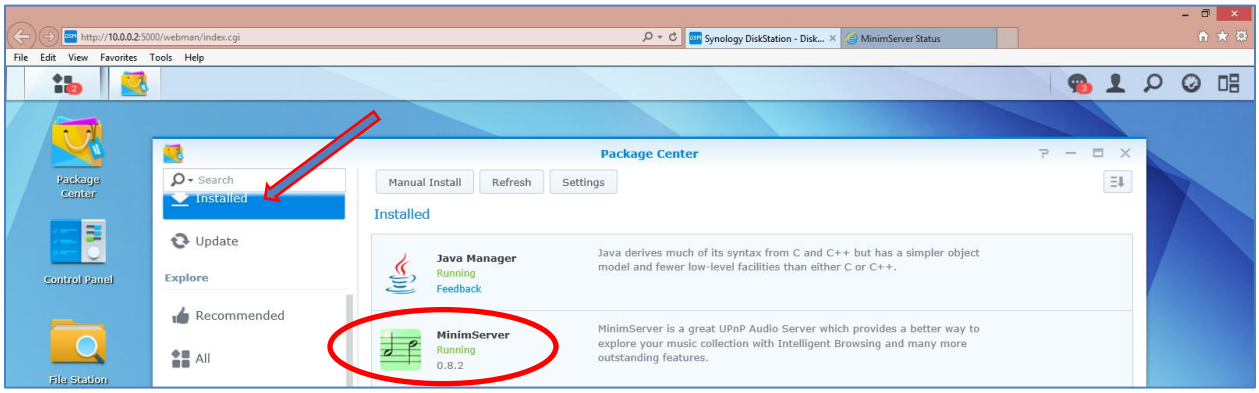
3. **Click** the checkbox to accept the license. Click **Next.**


MinimServer - Install
License Agreement
Please read the following license agreement before continuing.
MinimServer 0.8.2, Copyright (c) 2012-2014 Simon Nash. All rights reserved.
By downloading, installing or using this software, you accept the following license conditions.
1. You may use this software free of charge for personal and domestic purposes. Subject to condition 2, you may use this software free of charge for business purposes.
2. You may not redistribute this software (with or without modification), and you may not sell or distribute any product containing this software (with or without modification).
3. You may not decompile, disassemble or reverse engineer this software.
I accept the terms of the license agreement.
Next
Cancel

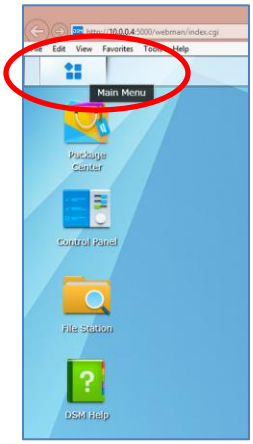
4. **Click** the checkbox to run after installation checkbox. Click **Next.**



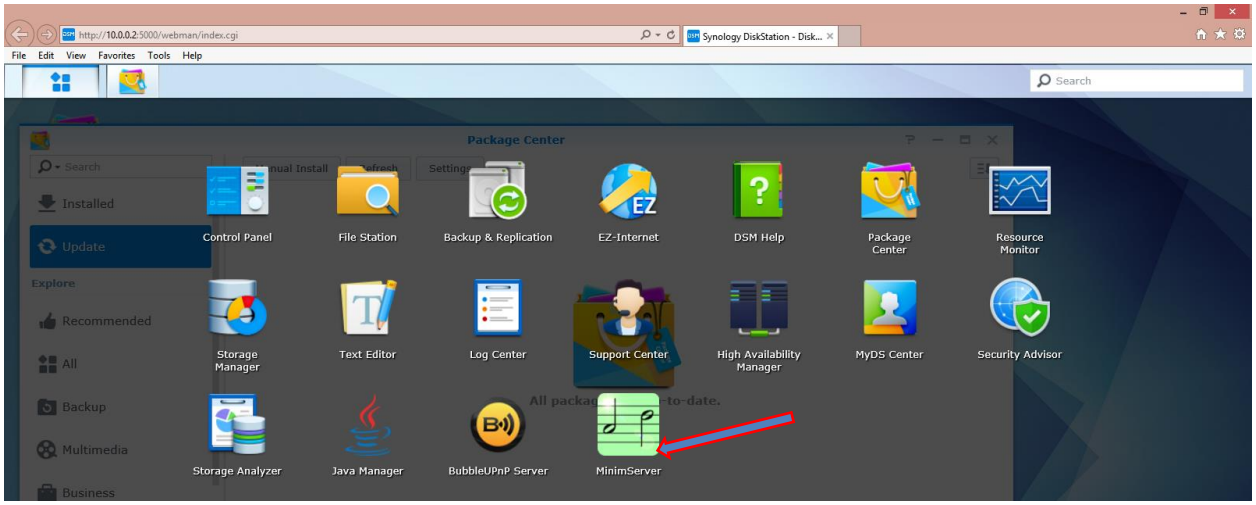
5. Back in the Package Center, if you click on Installed you will now see **MinimServer** Installed and with the Status of Running


Package Center
Manual Install
Refresh
Settings
Installed
Update
Explore
Recommended
All
Java Manager
Running
Feedback
Java derives much of its syntax from C and C++ but has a simpler object model and fewer low-level facilities than either C or C++.
MinimServer
Running
0.8.2
MinimServer is a great UPnP Audio Server which provides a better way to explore your music collection with Intelligent Browsing and many more outstanding features.

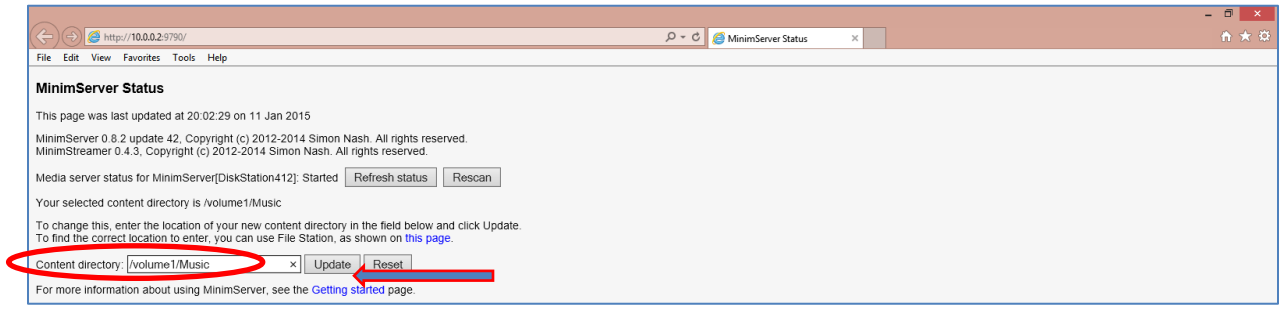
6. Back in the NAS Desktop, click on the Main Menu button



7. Click on the **MinimServer** program button



8. The MinimServer Status webpage will open up in your internet browser on your laptop. This page shows a few important elements of the MinimServer UPnP Server.
    a. It will show the UPnP Server status: **Started** is when it is up and running
    b. The **Rescan** button allows you to re-index the library. This is helpful if you have just added a few new albums to your library folder.
    c. The **Content Directory** points to the folder where your audio files are stored
    d. Helpful hyperlinks to a **Getting Started** guide and File Station to find your library directory
9. Add your NAS music folder in the **Content Directory** field and click the **Update** button. You can find the music folder name using the File Station (NAS version of Windows Explorer). You will only have to do this once.


http://10.0.0.2:9790/
MinimServer Status
File Edit View Favorites Tools Help
MinimServer Status
This page was last updated at 20:02:29 on 11 Jan 2015
MinimServer 0.8.2 update 42, Copyright (c) 2012-2014 Simon Nash. All rights reserved.
MinimStreamer 0.4.3, Copyright (c) 2012-2014 Simon Nash. All rights reserved.
Media server status for MinimServer[DiskStation412]: Started
Refresh status
Rescan
Your selected content directory is /volume1/Music
To change this, enter the location of your new content directory in the field below and click Update.
To find the correct location to enter, you can use File Station, as shown on this page.
Content directory: /volume1/Music
Update
Reset
For more information about using MinimServer, see the Getting started page.

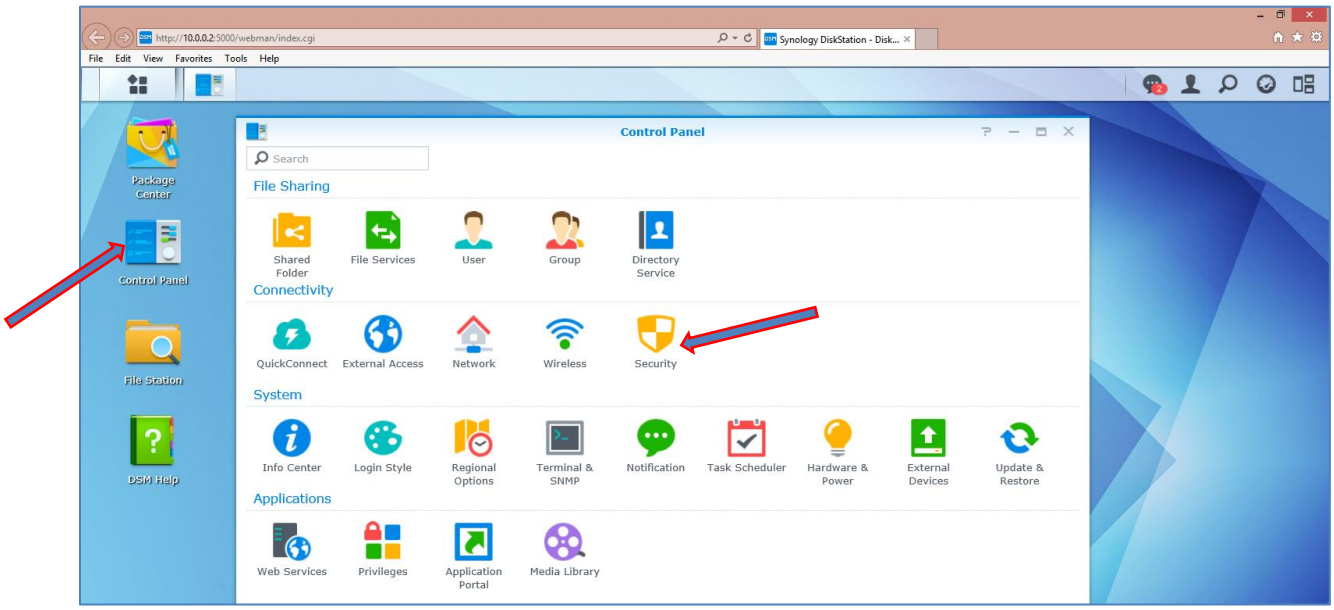
10. More information about MinimServer can be found on their website:

    - http://minimserver.com/synology/contentdir.html

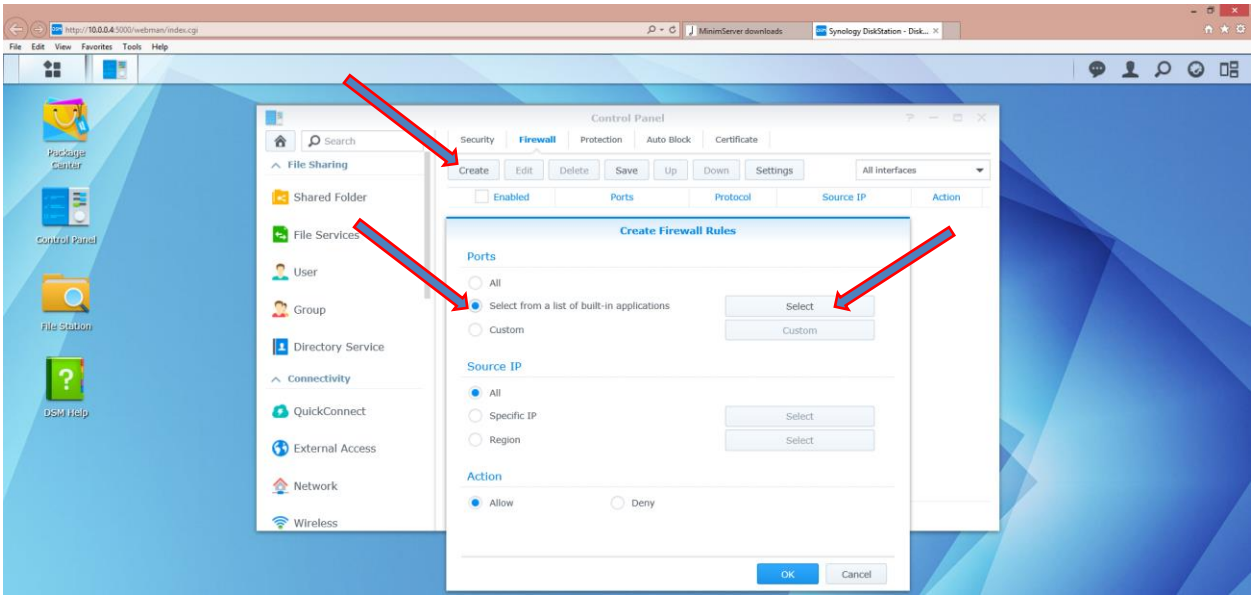
Step 6. Update the NAS Firewall Setting

Depending on your firewall setting, UPnP activity can sometimes be blocked on certain ports. The following steps update the firewall on the NAS to allow UPnP traffic.

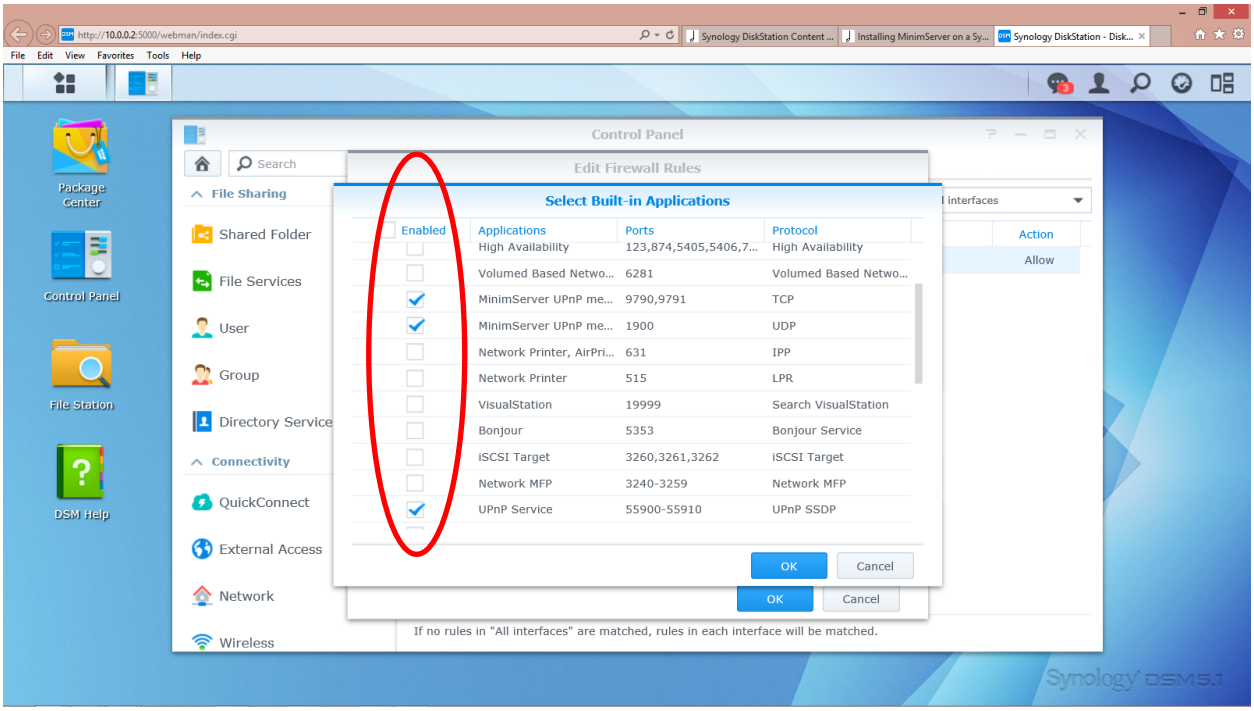
1. Navigate to the **Control Panel** on the NAS. Click on the **Security** button.



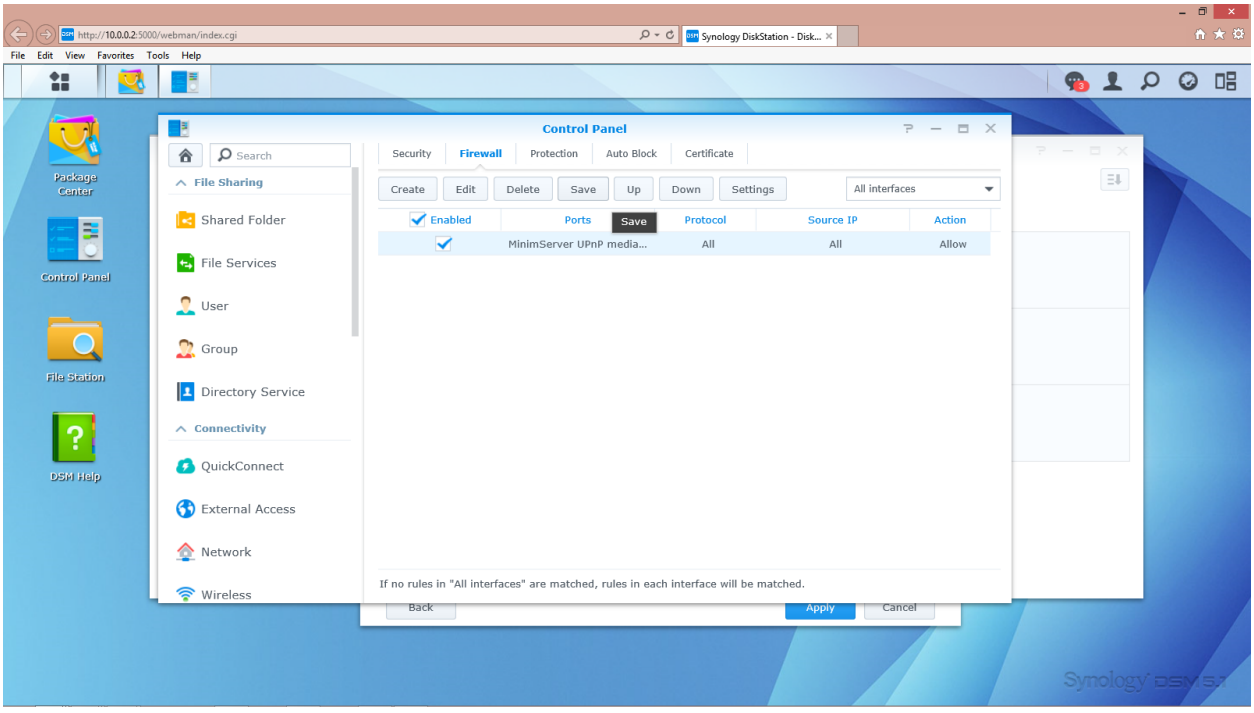
2. Navigate to the **Firewall** and click on the **Create** button. In the **Ports** section of the **Create Firewall Rules** page click on the "**Select from a list of built in applications**". Click on the **Select** button.



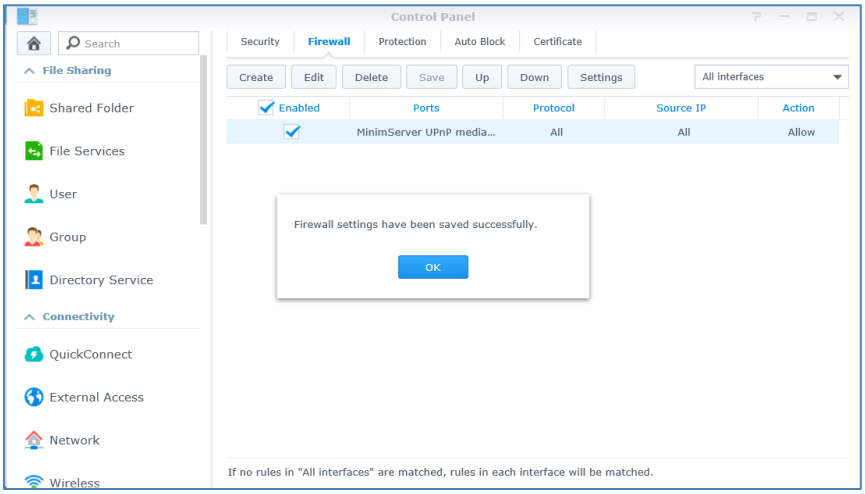
3. Check the Enabled checkboxes for MinimServer TCP, MinimServer UDP and UPnP Services. Click **OK**.



4. Back in the firewall page click on the **Save** button.



5. The following message will show. Click OK.



Note: The NAS firewall setting shown above is just one option and specific to UPnP playback. As you can see there are many settings that you can use to change the firewall settings further if that is required for your use.

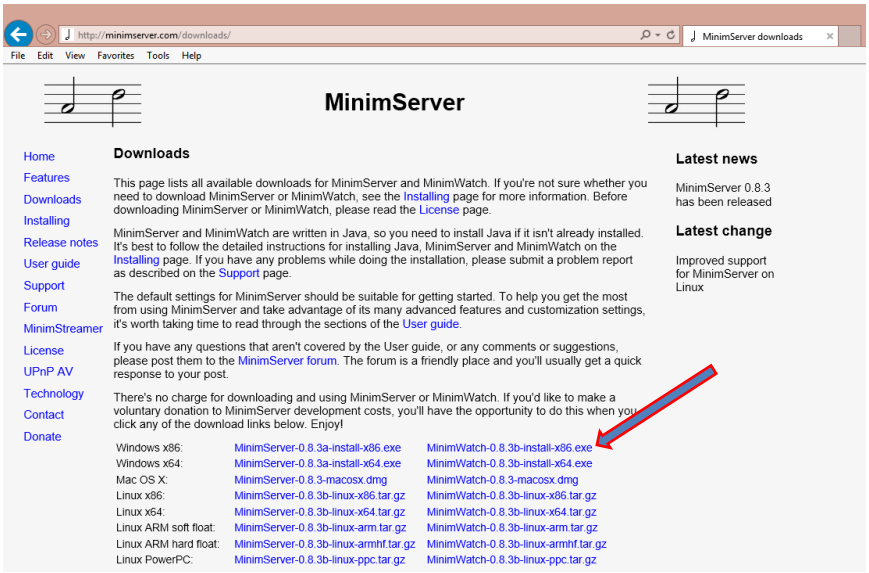
7.3 MinimWatch Installation

MinimWatch is not necessary to start enjoying your MSB Renderer with MinimServer, but it is a separate program which will be run on your laptop. It is used to make further setting changes and updates to the way the MinimServer UPnP server functions. It is MinimServer's optional administrator monitor and control program.

It is also where you can setup elements such as library name, transcoding rules, tag options, MinimStreamer, update the MinimServer program versions and review log notifications.

1. Navigate to the MinimServer download website on your **laptop** (Not the NAS) and be careful to choose correct version for your Operating System. If you are using 32 bit java on your laptop use 32 bit MinimWatch.

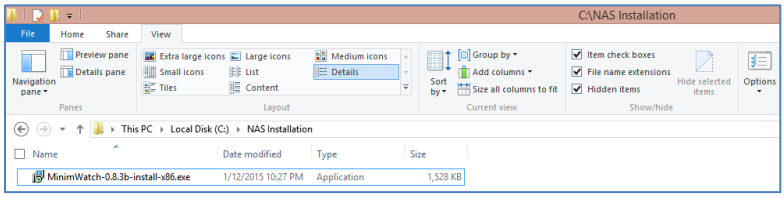
    - http://minimserver.com/downloads/


http://minimserver.com/downloads/
MinimServer downloads
File Edit View Favorites Tools Help
MinimServer
Home
Features
Downloads
Installing
Release notes
User guide
Support
Forum
MinimStreamer
License
UPnP AV
Technology
Contact
Donate
Downloads
This page lists all available downloads for MinimServer and MinimWatch. If you're not sure whether you need to download MinimServer or MinimWatch, see the Installing page for more information. Before downloading MinimServer or MinimWatch, please read the License page.
MinimServer and MinimWatch are written in Java, so you need to install Java if it isn't already installed. It's best to follow the detailed instructions for installing Java, MinimServer and MinimWatch on the Installing page. If you have any problems while doing the installation, please submit a problem report as described on the Support page.
The default settings for MinimServer should be suitable for getting started. To help you get the most from using MinimServer and take advantage of its many advanced features and customization settings, it's worth taking time to read through the sections of the User guide.
If you have any questions that aren't covered by the User guide, or any comments or suggestions, please post them to the MinimServer forum. The forum is a friendly place and you'll usually get a quick response to your post.
There's no charge for downloading and using MinimServer or MinimWatch. If you'd like to make a voluntary donation to MinimServer development costs, you'll have the opportunity to do this when you click any of the download links below. Enjoy!
Latest news
MinimServer 0.8.3 has been released
Latest change
Improved support for MinimServer on Linux
Windows x86: MinimServer-0.8.3a-install-x86.exe MinimWatch-0.8.3b-install-x86.exe
Windows x64: MinimServer-0.8.3a-install-x64.exe MinimWatch-0.8.3b-install-x64.exe
Mac OS X: MinimServer-0.8.3-macosx.dmg MinimWatch-0.8.3-macosx.dmg
Linux x86: MinimServer-0.8.3b-linux-x86.tar.gz MinimWatch-0.8.3b-linux-x86.tar.gz
Linux x64: MinimServer-0.8.3b-linux-x64.tar.gz MinimWatch-0.8.3b-linux-x64.tar.gz
Linux ARM soft float: MinimServer-0.8.3b-linux-arm.tar.gz MinimWatch-0.8.3b-linux-arm.tar.gz
Linux ARM hard float: MinimServer-0.8.3b-linux-armhf.tar.gz MinimWatch-0.8.3b-linux-armhf.tar.gz
Linux PowerPC: MinimServer-0.8.3b-linux-ppc.tar.gz MinimWatch-0.8.3b-linux-ppc.tar.gz

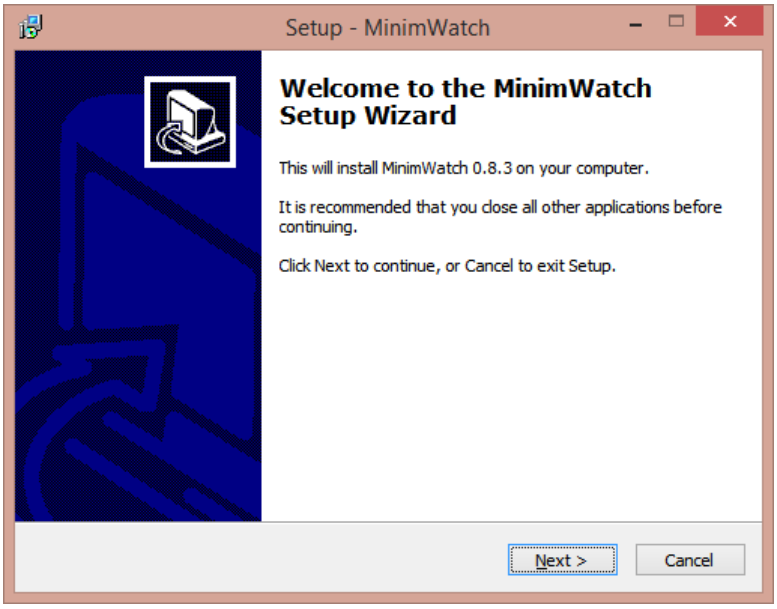
2. In this case since the laptop is using 32 bit Java on Windows 8.1 the installation file is called:

    - MinimWatch-0.8.3b-install-x86.exe

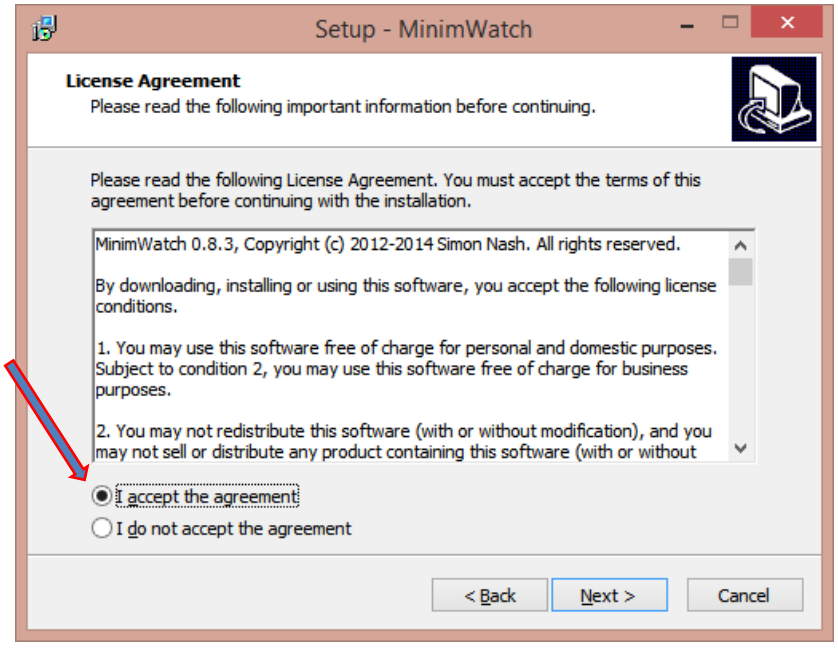
3. **Save** the installation file on a folder on your laptop


C:\NAS Installation
File Home Share View
This PC Local Disk (C:) NAS Installation
Name Date modified Type Size
MinimWatch-0.8.3b-install-x86.exe 1/12/2015 10:27 PM Application 1,528 KB

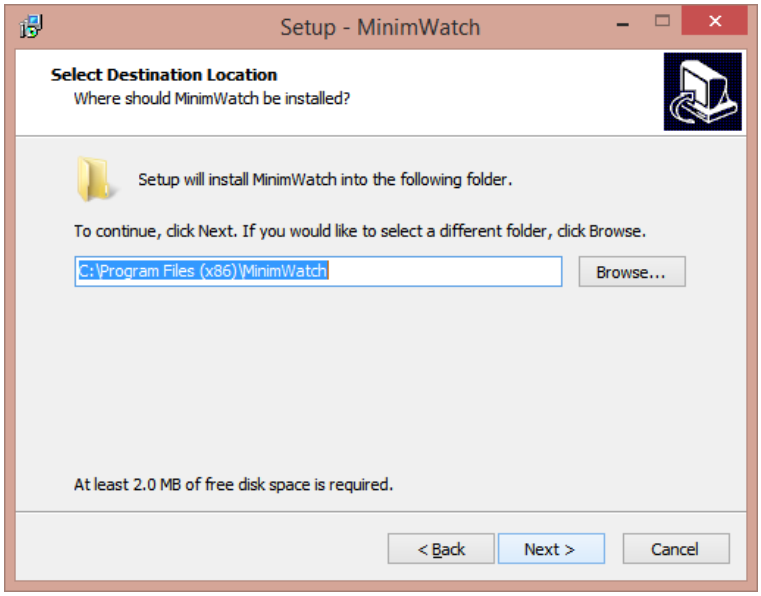
4. **Run** the installation file by double clicking on the executable installation program. Click **Next** on the Setup screen


Setup - MinimWatch
Welcome to the MinimWatch Setup Wizard
This will install MinimWatch 0.8.3 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

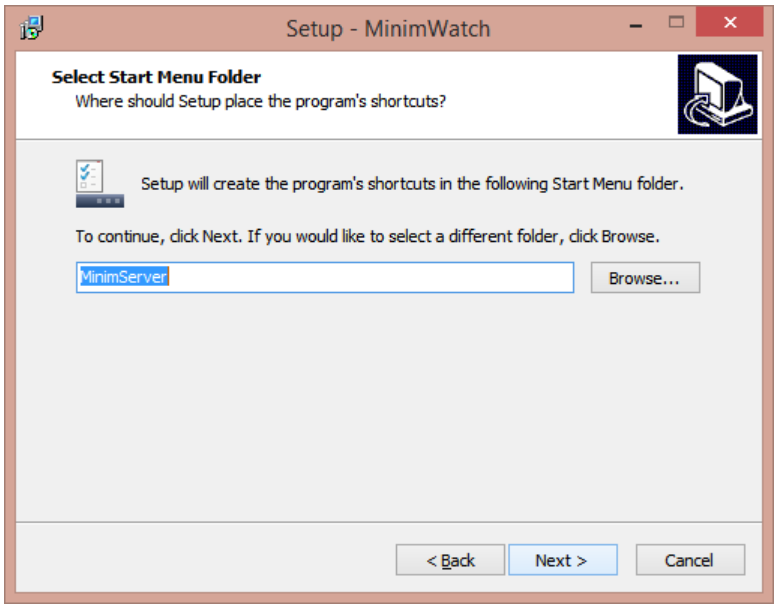
5. **Accept** the agreement by clicking the radio button. Click **Next**.


Setup - MinimWatch
License Agreement
Please read the following important information before continuing.
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.
MinimWatch 0.8.3, Copyright (c) 2012-2014 Simon Nash. All rights reserved.
By downloading, installing or using this software, you accept the following license conditions.
1. You may use this software free of charge for personal and domestic purposes. Subject to condition 2, you may use this software free of charge for business purposes.
2. You may not redistribute this software (with or without modification), and you may not sell or distribute any product containing this software (with or without
I accept the agreement
I do not accept the agreement
< Back
Next >
Cancel

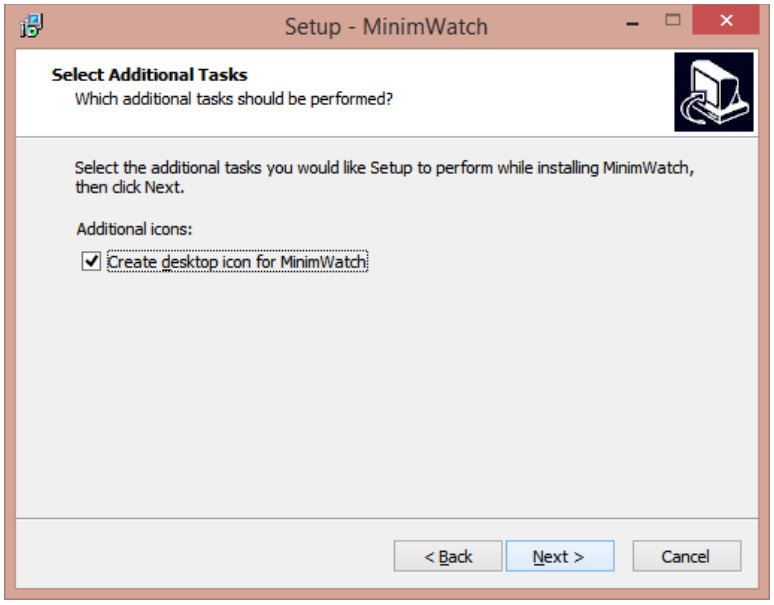
6. Leave the default installation folder, or change if your desire. Click **Next**.


Setup - MinimWatch
Select Destination Location
Where should MinimWatch be installed?
Setup will install MinimWatch into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files (x86)\MinimWatch
Browse...
At least 2.0 MB of free disk space is required.
< Back
Next >
Cancel

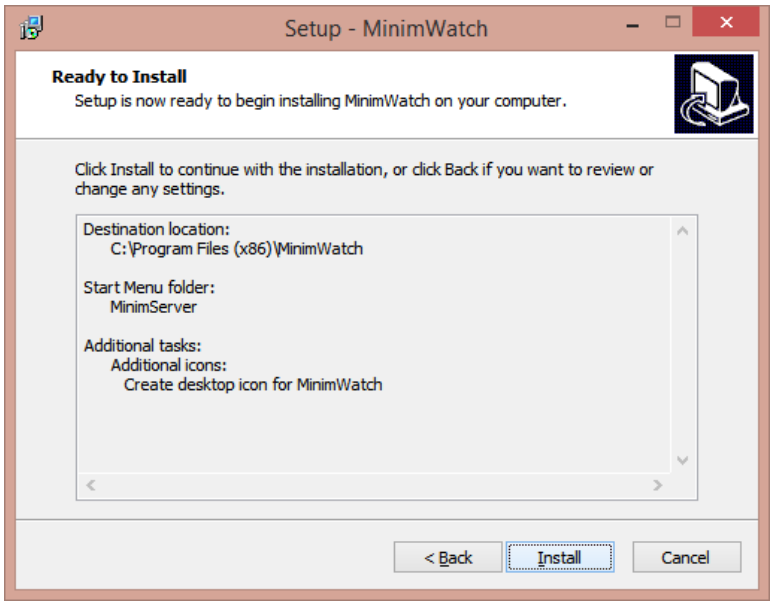
7. Click **Next**.


Setup - MinimWatch
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
MinimServer
Browse...
< Back
Next >
Cancel

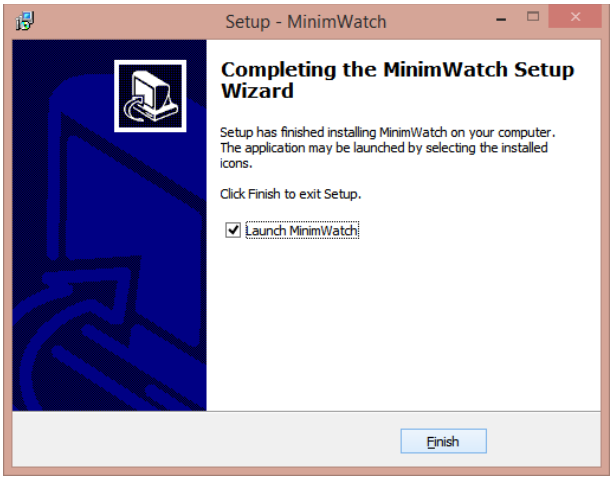
8. Click **Next**. It will create a desktop shortcut for you by default.


Setup - MinimWatch
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing MinimWatch, then click Next.
Additional icons:
Create desktop icon for MinimWatch
< Back
Next >
Cancel

9. Click Next.


Setup - MinimWatch
Ready to Install
Setup is now ready to begin installing MinimWatch on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files (x86)\MinimWatch
Start Menu folder:
MinimServer
Additional tasks:
Additional icons:
Create desktop icon for MinimWatch
< Back
Install
Cancel

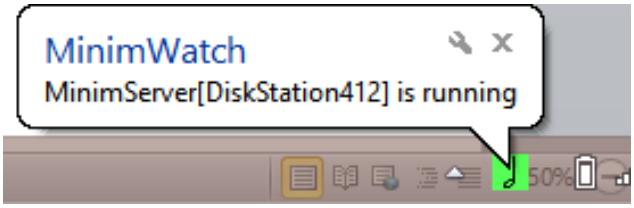
10. Click Finish. MiminWatch will launch automatically in the background.


Setup - MinimWatch
Completing the MinimWatch Setup Wizard
Setup has finished installing MinimWatch on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Launch MinimWatch
Finish

11. In the bottom right corner you will see an icon of a musical note for the MinimWatch program when it is running. It will try to connect with the MinimServer running on your NAS automatically.

- The icon will show yellow when MinimServer is starting

- The icon will show green when MinimServer is up and running and MinimWatch has connection



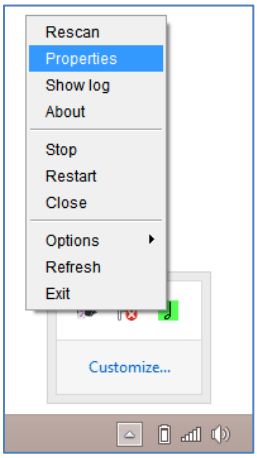
Please note: If the icon stays grey and MinimWatch cannot connect to the NAS it is often the firewall on your laptop that is blocking the connection. A suggestion is to **temporarily** turn off the firewall on your laptop just for the duration of any MinimWatch setup changes you want to make. You can close down MinimWatch and turn back on the firewall after you are done. It will not change the running of the MinimServer on the NAS, nor impact your audio streaming.

For more details on MinimWatch please check out the following website:

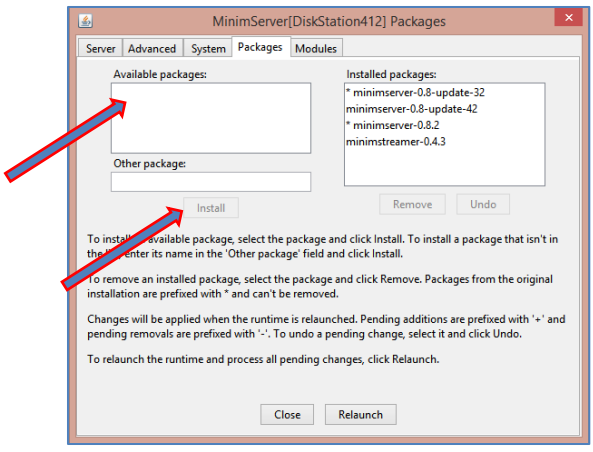
- http://minimserver.com/install-windows-mwatch.html

12. **Right-Click** on the MinimWatch icon on the bottom right corner, and select from the pop-up menu. Various selection are available:

- **Rescan –** If you have recently added files or folders to your music library and you want them to become visible to your UPnP Server and Controller
- **Properties –** Any additional setting changes and version updates are done here
- **Show log –** This provides you detailed information on possible issues with the server or your library
- **Stop –** To stop the MinimServer UPnP Server
- **Restart –** To restart the MinimServer UPnP Server
- **Options –** Select the detail of logging
- **Exit –** Close MinimWatch program



13. Initially no setup changes are required, but it is a good idea to see whether there are new versions available. **Right-Click** on the MinimWatch icon on the bottom right corner, and select **Properties** from the pop-up. Navigate to the **Packages** tab. If any additional available packages are showing you can select and install them from here. Follow the prompts. If the Available packages list is empty you are up-to-date and exit out of MinimWatch.


MinimServer[DiskStation412] Packages
Server
Advanced
System
Packages
Modules
Available packages:
Installed packages:
* minimserver-0.8-update-32
minimserver-0.8-update-42
* minimserver-0.8.2
minimstreamer-0.4.3
Other package:
Install
Remove
Undo
To remove an installed package, select the package and click Remove. Packages from the original installation are prefixed with * and can't be removed.
Changes will be applied when the runtime is relaunched. Pending additions are prefixed with '+' and pending removals are prefixed with '-'. To undo a pending change, select it and click Undo.
To relaunch the runtime and process all pending changes, click Relaunch.
Close
Relaunch

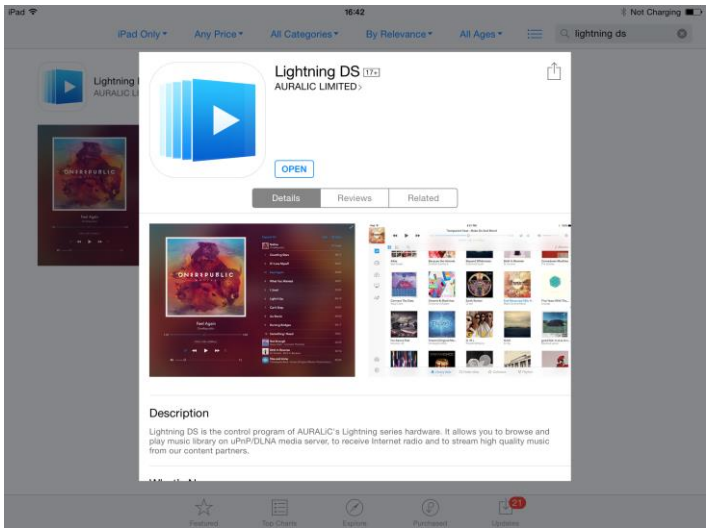
7.4 UPnP Controller Installation - Lightning DS

For the UPnP remote control we will be using the **Lightning DS** application on the iPad to access and command your music library in this example.

It is free, and you can of course use any of the other UPnP Controller applications with MinimServer, but Lightning DS, although not perfect, is one of the few that handles gapless and has a user friendly look and feel.

Step 1. Purchase and Install Lightning DS Application on your iPad

On your iPad open the App Store and search for **Lightning DS**.


iPad Only
Any Price
All Categories
By Relevance
All Ages
lightning ds
Lightning DS
AURALIC LIMITED
OPEN
Details
Reviews
Related
Description
Lightning DS is the control program of AURALIC's Lightning series hardware. It allows you to browse and play music library on uPnP/DLNA media server, to receive Internet radio and to stream high quality music from our content partners.

Click on **INSTALL** and follow the instructions to purchase the App.

Note: For more details on the Lightning DS Controller you can go their website for a user guide:

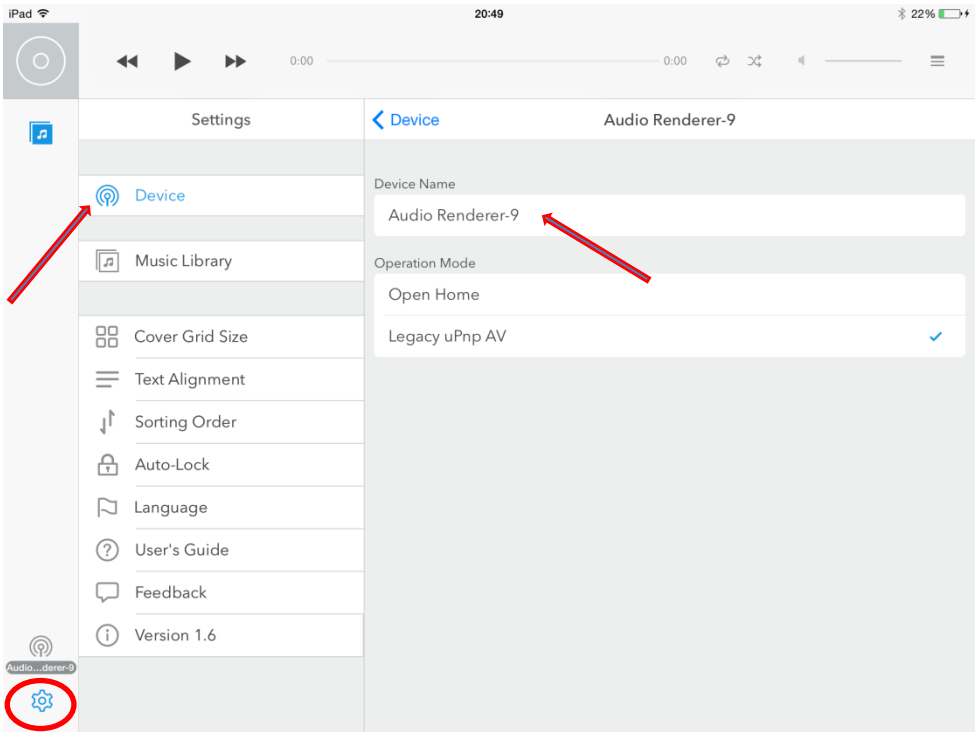
- http://www.auralic.com/en/LightningDS/guide.html

Step 2. Open the Lightning DS App and Setup

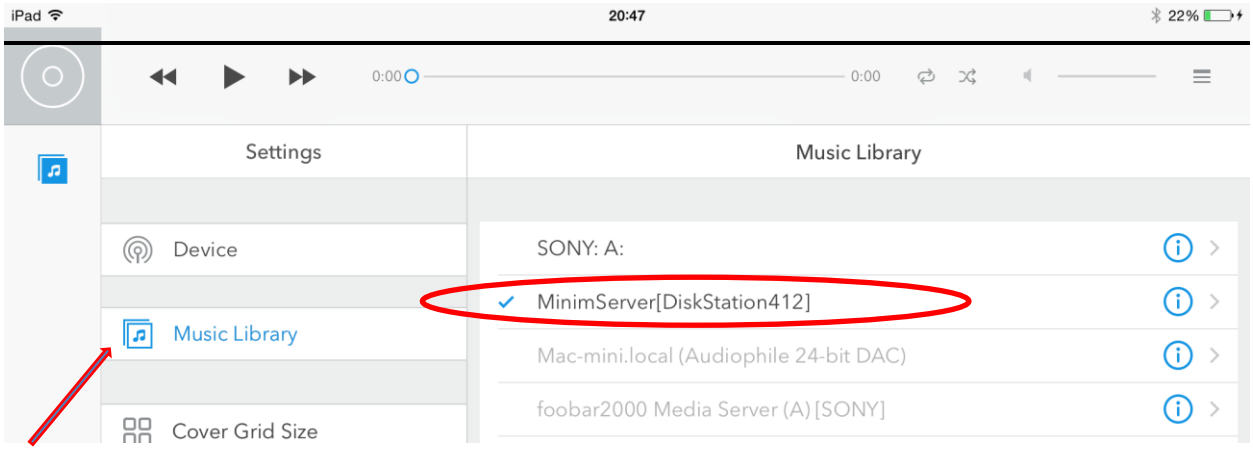
1. Open the Lightning app on the iPad

Note: Make sure your DAC and NAS are turned on and MinimServer is running.

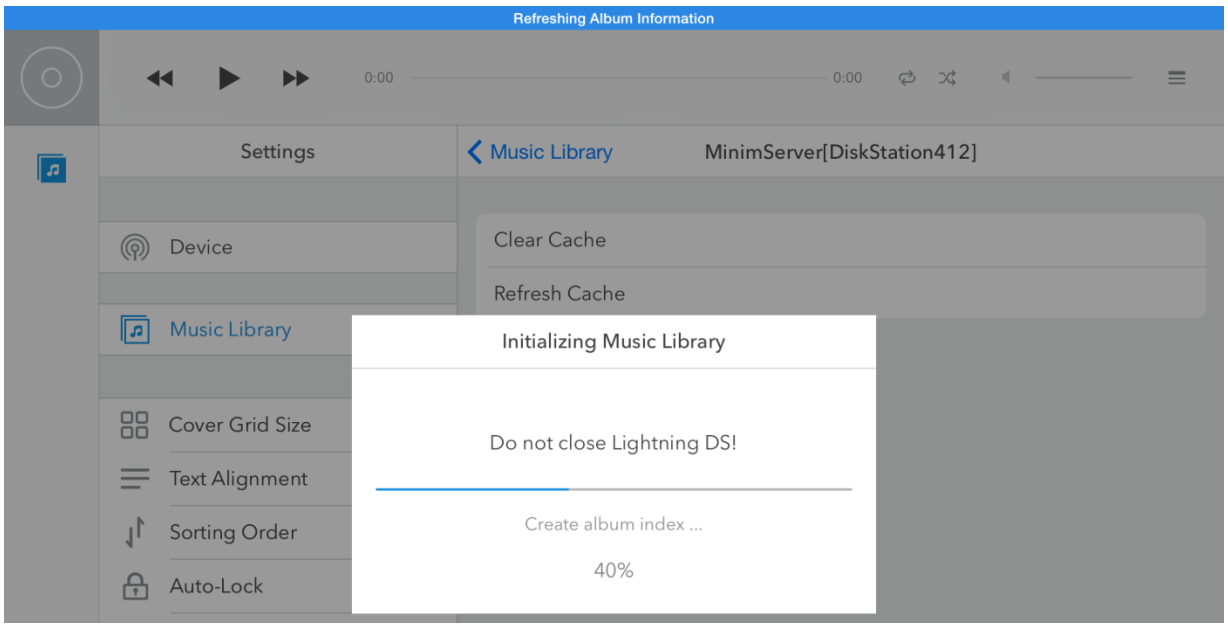
2. Tap on the **Settings** button in the bottom left-hand corner. Select **Device**. Make sure the MSB Renderer (default name is **Audio** or **MSB Tech Renderer-X**, where X is the last digit of the IP Address given to the MSB Renderer by your router) is showing and select it.



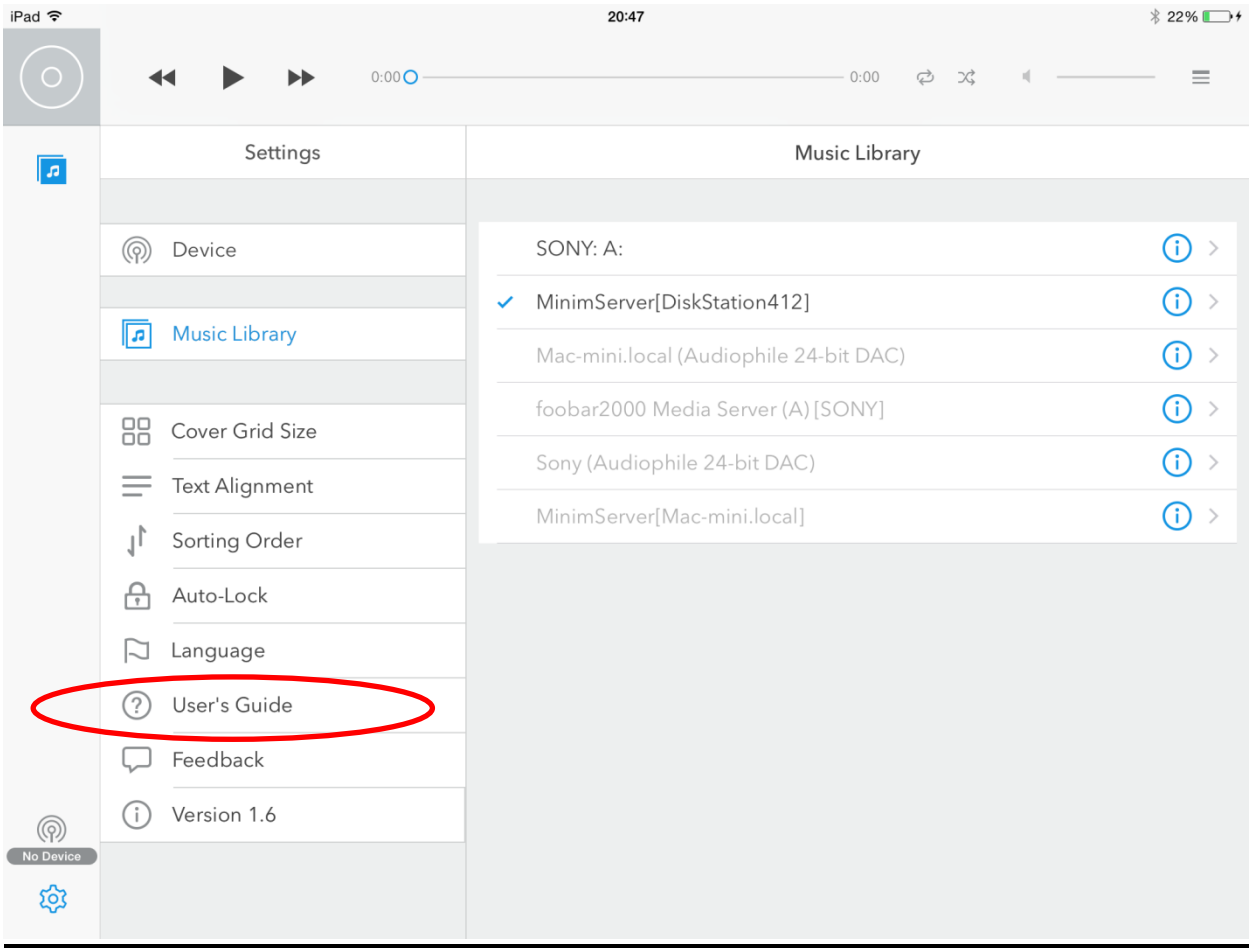
3. Tap on **Music Library**. Select the correct UPnP Server. In this example the MinimServer UPnP Server is running on the DiskStation412. A checkbox will appear next to the selected library.



4. The first time you choose the library, or when you Refresh the Cache if there is a library change, the application will update the album index and art on the iPad. Do NOT close the application at this time. It could take up to 5-10 minutes the first time with subsequent refreshes being much quicker, depending on the library size.



5. There are more setting changes you can make to personalize your experience. There is also a link to the User Guide from within the Settings screen.

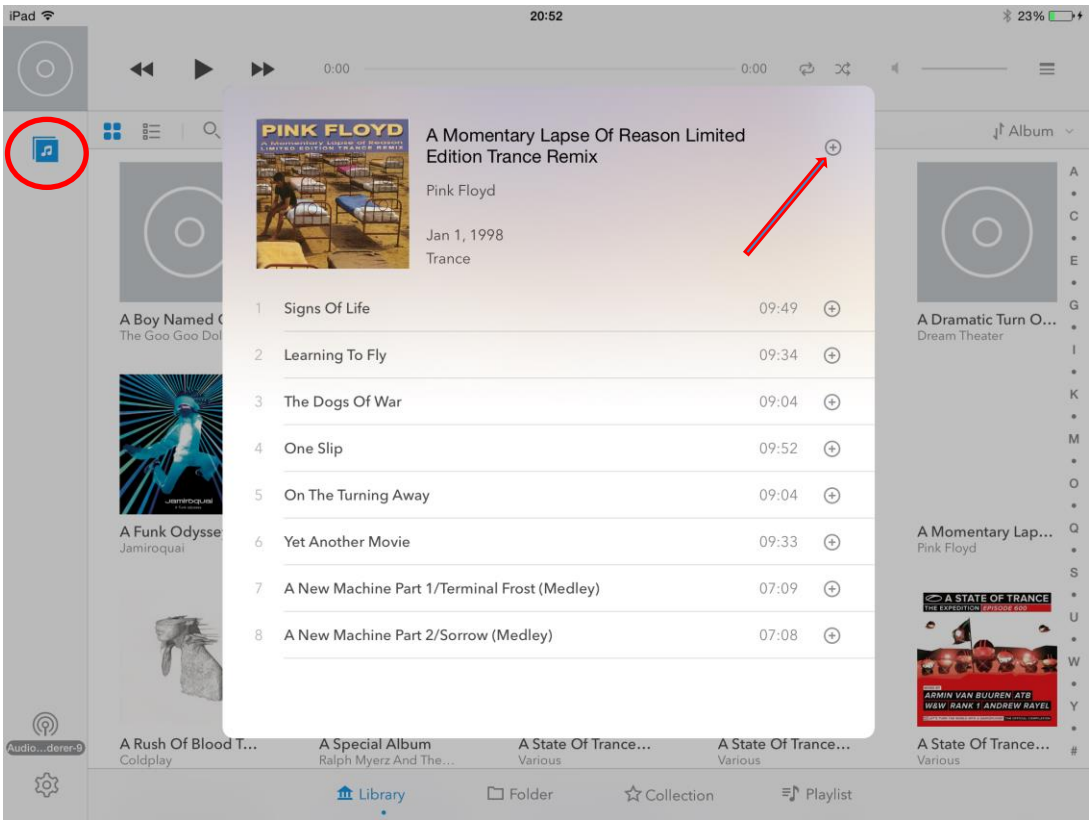


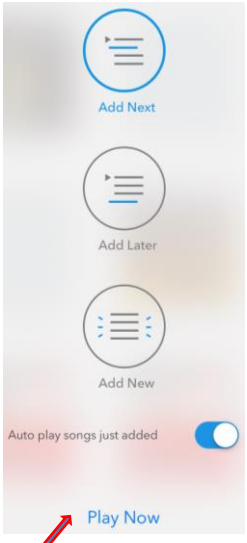
6. You are now ready to enjoy your music library by accessing it remotely using the Lightning DS application on the iPad as the remote control. Refer to the Lightning DS User Guide for helpful details.

   Please keep in mind with any UPnP controller, when you select and album or playlist for playback, do not navigate away from the Controller or the music will stop playing after the current song.

   It is recommended to completely reboot the iPad after the initial library load and whenever you run into responsiveness issues as the memory on the iPad might run low.

7. Tap on the Audio button in the top left hand corner to access your library. Select the album to play. Use the ⊕ icon on the right to add a complete album or individual song to the Queue for playback. Click on the **Play Now.**





7.5 Internet Radio on a NAS

Internet Radio is a great way to listen to streaming audio. Using MinimServer to access an internet radio station is simple once you know how, but is not intuitive.

MinimServer supports network streams as http:// entries in .m3u playlist files via a small extension called MinimStream. To route a network stream such as an internet radio station via the MinimStreamer extension, the name of the stream must be specified in an .m3u playlist file using a specific format. This sounds more complicated than it is, so below are the steps to follow.

Step 1. Find the URL of your radio station

The easiest way is to use google to find the radio station URL. There are a few different playback formats, and not always are the URLs made readily available, nor do they always work. A bit of trial and error is required to find the correct URL. Luckily there are a few websites available that have collected many of the popular URLs.

For example:

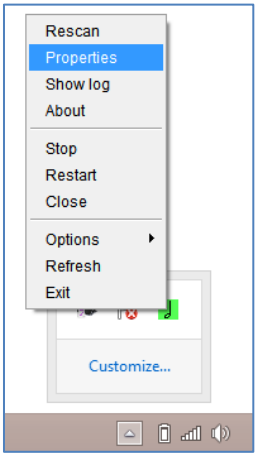
- http://wiki.slimdevices.com/index.php/Internet_radio_URLs
- http://www.mikesradioworld.com/
- http://www.shoutcast.com/

Step 2. Add the Streamer extensions to MinimServer

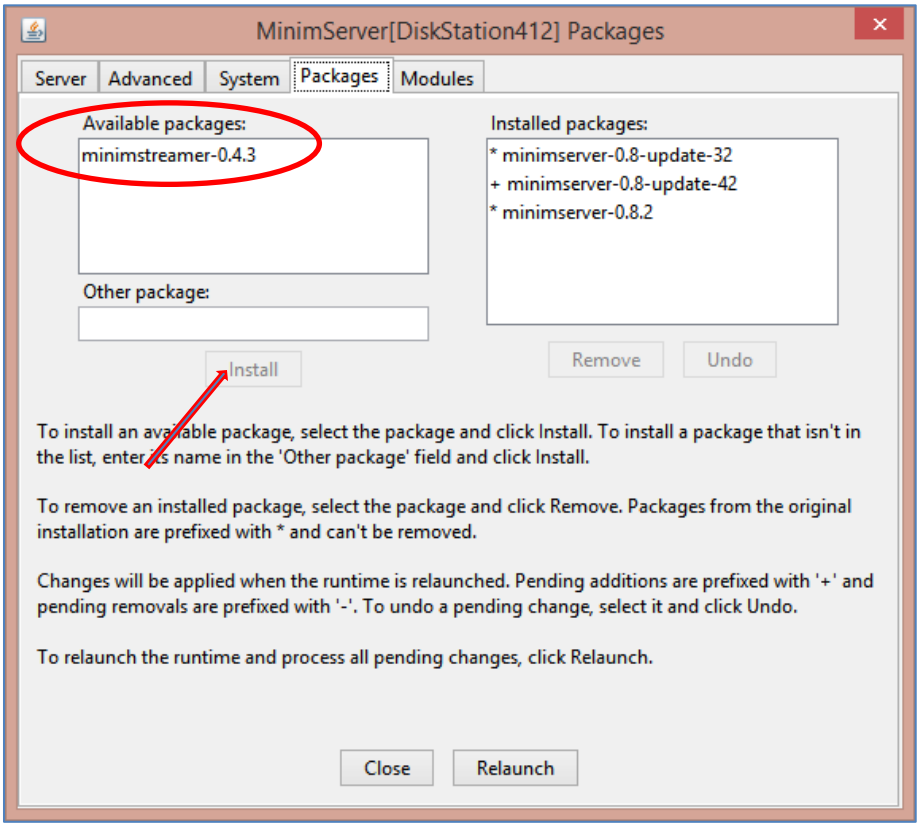
Using MinimWatch, the admin program for MinimServer that was installed earlier, you can quickly add the MinimStreamer extension.

1. Open the MinimWatch program using the shortcut on your laptop's desktop:

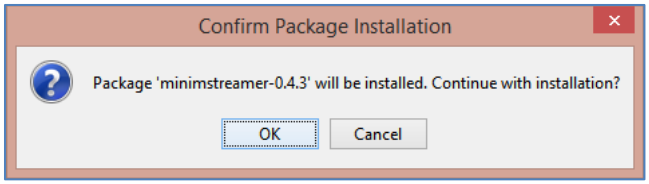
2. **Right-Click** on the MinimWatch icon on the bottom right corner, and select **Properties** from the pop-up menu.



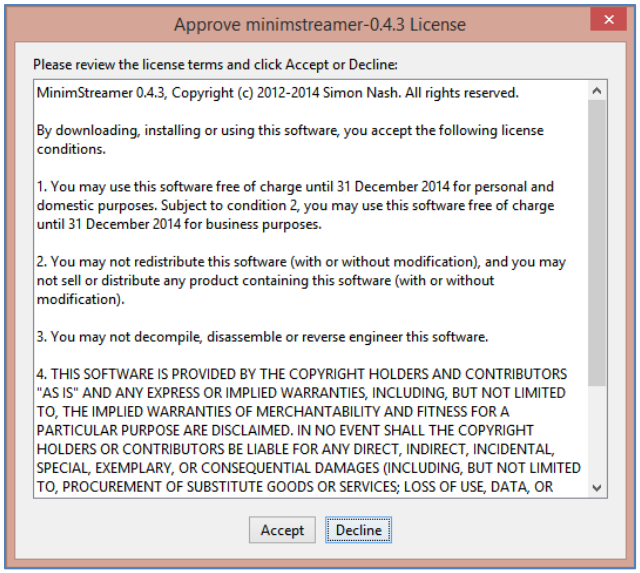
3. Navigate to the **Packages** tab. If the **minimstreamer** package already shows in the installed packages tab you can skip this step. If it has not been installed yet, select it from the Available packages tab and click **Install.**


MinimServer[DiskStation412] Packages
Server
Advanced
System
Packages
Modules
Available packages:
minimstreamer-0.4.3
Installed packages:
* minimserver-0.8-update-32
+ minimserver-0.8-update-42
* minimserver-0.8.2
Other package:
Install
Remove
Undo
To install an available package, select the package and click Install. To install a package that isn't in the list, enter its name in the 'Other package' field and click Install.
To remove an installed package, select the package and click Remove. Packages from the original installation are prefixed with * and can't be removed.
Changes will be applied when the runtime is relaunched. Pending additions are prefixed with '+' and pending removals are prefixed with '-'. To undo a pending change, select it and click Undo.
To relaunch the runtime and process all pending changes, click Relaunch.
Close
Relaunch

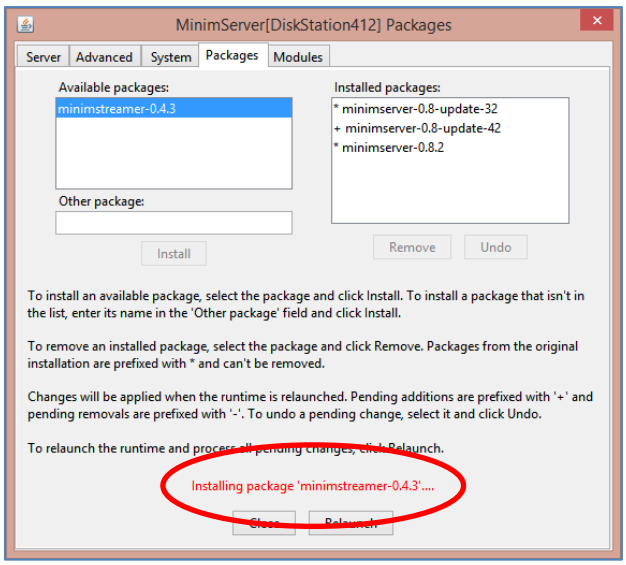
4. Click **OK** to confirm



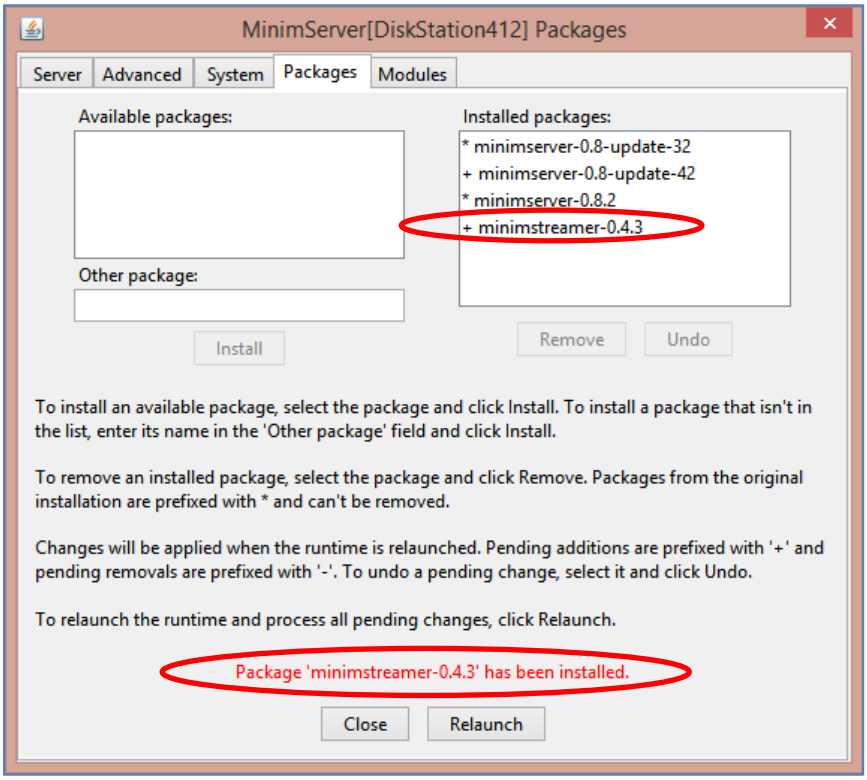
5. Click **Accept**.


Approve minimstreamer-0.4.3 License
Please review the license terms and click Accept or Decline:
MinimStreamer 0.4.3, Copyright (c) 2012-2014 Simon Nash. All rights reserved.
By downloading, installing or using this software, you accept the following license conditions.
1. You may use this software free of charge until 31 December 2014 for personal and domestic purposes. Subject to condition 2, you may use this software free of charge until 31 December 2014 for business purposes.
2. You may not redistribute this software (with or without modification), and you may not sell or distribute any product containing this software (with or without modification).
3. You may not decompile, disassemble or reverse engineer this software.
4. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR
Accept
Decline

6. Wait until the installation process is complete


MinimServer[DiskStation412] Packages
Server
Advanced
System
Packages
Modules
Available packages:
minimstreamer-0.4.3
Other package:
Install
Installed packages:
* minimserver-0.8-update-32
+ minimserver-0.8-update-42
* minimserver-0.8.2
Remove
Undo
To install an available package, select the package and click Install. To install a package that isn't in the list, enter its name in the 'Other package' field and click Install.
To remove an installed package, select the package and click Remove. Packages from the original installation are prefixed with * and can't be removed.
Changes will be applied when the runtime is relaunched. Pending additions are prefixed with '+' and pending removals are prefixed with '-'. To undo a pending change, select it and click Undo.
To relaunch the runtime and process all pending changes, click Relaunch.
Installing package 'minimstreamer-0.4.3'....

7. Once installation is complete the minimstreamer package will show in the Installed packages tab. Click **Relaunch.**


MinimServer[DiskStation412] Packages
Server
Advanced
System
Packages
Modules
Available packages:
Installed packages:
* minimserver-0.8-update-32
+ minimserver-0.8-update-42
* minimserver-0.8.2
+ minimstreamer-0.4.3
Other package:
Install
Remove
Undo
To install an available package, select the package and click Install. To install a package that isn't in the list, enter its name in the 'Other package' field and click Install.
To remove an installed package, select the package and click Remove. Packages from the original installation are prefixed with * and can't be removed.
Changes will be applied when the runtime is relaunched. Pending additions are prefixed with '+' and pending removals are prefixed with '-'. To undo a pending change, select it and click Undo.
To relaunch the runtime and process all pending changes, click Relaunch.
Package 'minimstreamer-0.4.3' has been installed.
Close
Relaunch

In addition to the ability to play certain internet radio stations, when MinimStreamer is running, the stream.converter, stream.record and stream.transcode setup options will become available in the System tab as well. Please refer to the MinimServer's website for additional information should you want to use this functionality in the future.

For more details on MinimServer please check out the following website:

- http://minimstreamer.com/userguide.html

Step 3. Create an Internet Radio Playlist

UPnP Controllers and Servers are able to view and start playback on a playlist. You can create one playlist with multiple radio stations, or multiple playlists for each radio station.

The example below will add two internet radio stations on one Playlist.

1. Open the Notepad program on your laptop

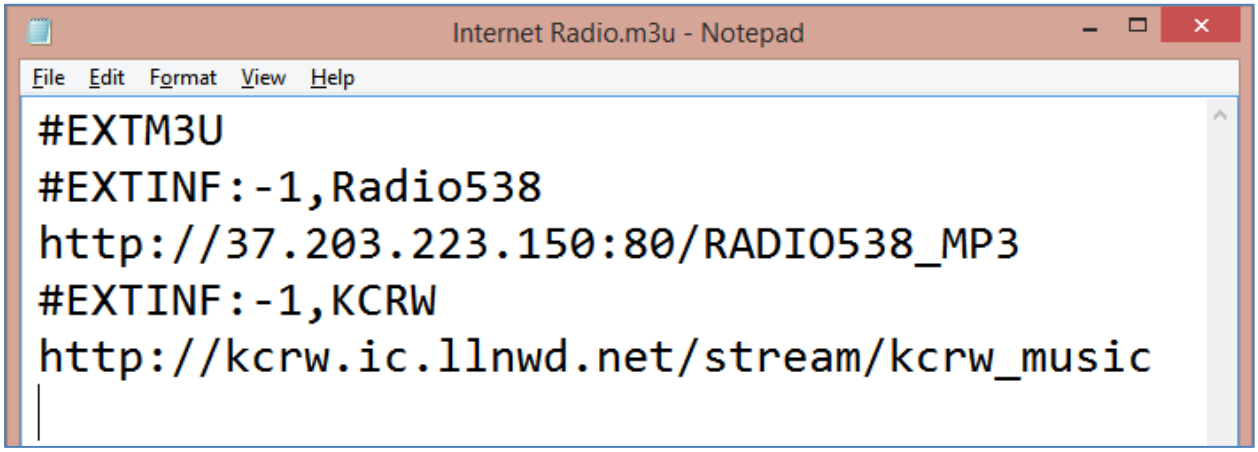
The format of the text to add in the Notepad is as follows. One playlist header followed by two lines for each radio station's URL:

- One Playlist header row : #EXTM3U
- The radio station name row with the prefix: #EXTINF:-1,
- The URL row

```
#EXTM3U
#EXTINF:-1,Radio538
http://37.203.223.150:80/RADIO538_MP3
#EXTINF:-1,KCRW
http://kcrw.ic.llnwd.net/stream/kcrw_music
```

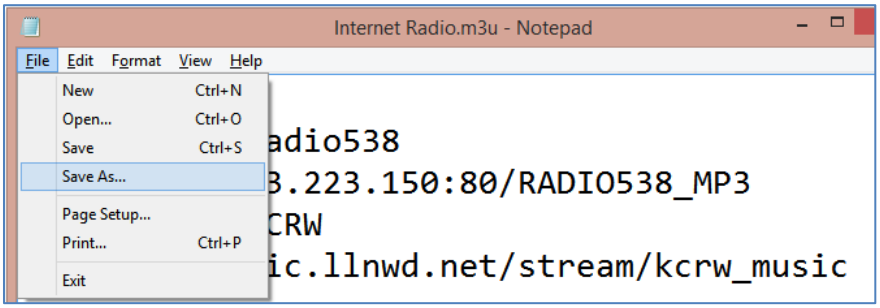
In this example the green text denotes the Radio538 internet radio stream and the orange denotes a second radio station KCRW. To add more stations you would add an additional two lines for each radio station in similar fashion.

2. Add the necessary text in the Notepad for all your desired radio stations

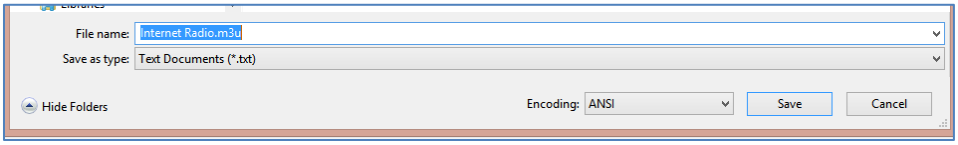


3. **Save** the notepad file as an **.m3u** file in your Audio Library folder on the NAS.

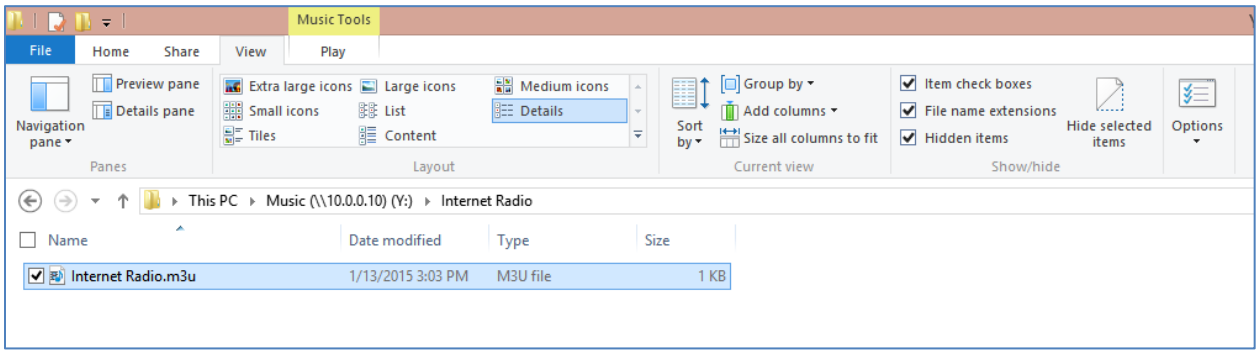
   Select File → Save As



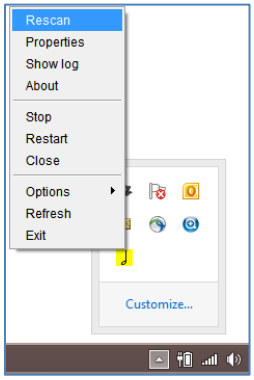
   Change the filename and extension to **Internet Radio.m3u**



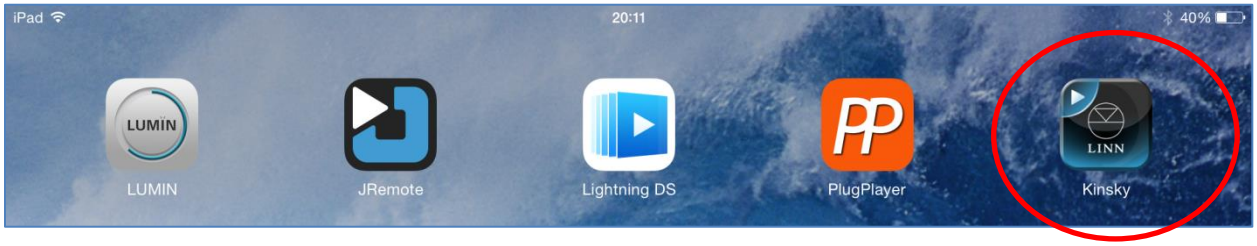
   In this example a separate **Internet Radio** folder is created in the NAS Music Folder for easy maintenance.



4. **Right-Click** on the MinimWatch icon on the bottom right corner, and select **Rescan** from the pop-up menu. This will provide the UPnP server MinimServer with the added folder and playlist files for visibility and playback



5. **Open** up the **UPnP Controller**. The Lightning DS Controller does not at this time handle Internet Radio, but another free UPnP Controller Linn Kinsky does. Download it on to your iPad from the App Store and Open it up.



6. Make sure the MSB Renderer (Audio Renderer – X) is selected as the room and MinimServer on Diskstation412 library is selected. Navigate to the folder Internet Radio and select the radio station that was added as a playlist. You can see both stations show.

7.6 Open Home Media Emulation on a NAS

As mentioned before, OpenHome Media (ohMedia) is an open standard for networked audio devices created by Linn, which has better support for playlists, allowing gapless playback to continue when the Controller leaves the network or if you navigate to another program on your Controller. In addition, the CD quality streaming service Tidal (Called WimP in Europe) can be accessed using an ohMedia emulation. Devices can implement ohMedia in place of, or alongside the UPnP AV protocols.

The following steps will show you how to setup ***Bubble UPnP Server,*** using the example of a Synology NAS. The goal is to provide the ability to use some of the better ohMedia Controllers such as Linn Kazoo or Lumin, as well as a way to stream the CD quality Tidal streaming service.

A few important notes before we get started:

Note 1: At this point the MSB Network Renderer module is not Open Home Media certified, but there is an emulation program called ***Bubble UPnP Server*** which allows the MSB Network Renderer to be seen as an Open Home Media Renderer.

Note 2: Bubble UPnP Server should not be confused with being an UPnP Server, as it is not, but instead runs on top of your UPnP Server to provide additional functionalities.

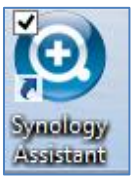
Note 3: Your UPnP Server, in our example MinimServer, and Java Manager should be installed and already running on your NAS before starting the installation of Bubble UPnP Server.

Note 4: Your MSB Renderer module should be installed on your network and turned on.

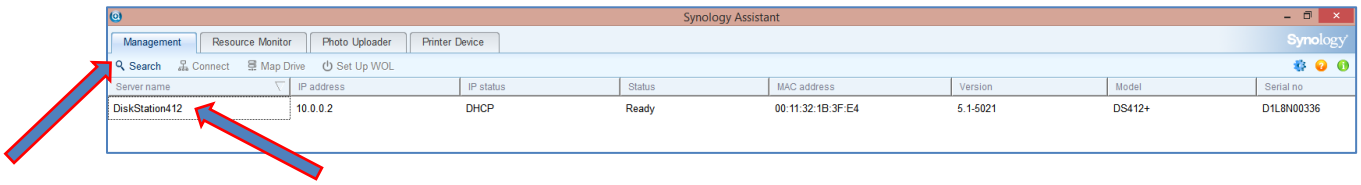
Step 1. Prepare NAS and Download Bubble UPnP Server

From your computer, Log into your Synology NAS as the administrator

1. Click on the Synology Assistant desktop shortcut that was created during the installation on the laptop.

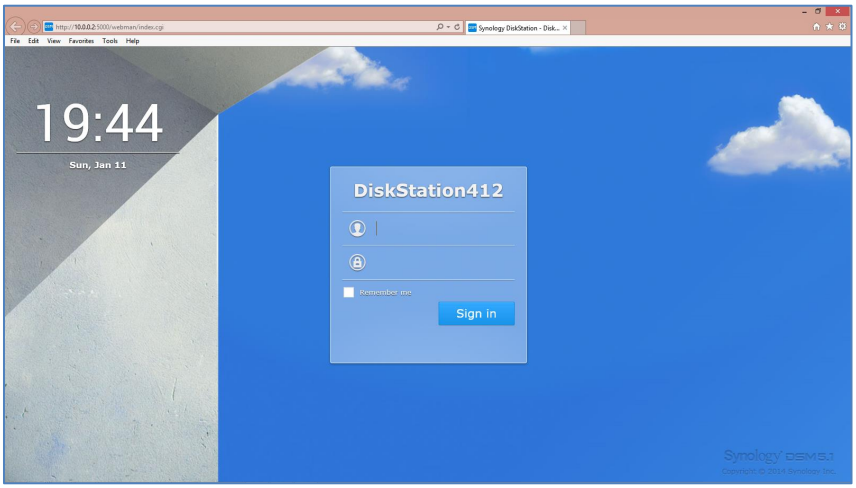


The Synology Assistant will search for your NAS on the network in the Management tab. Just click on the Search button and wait for a few moments.

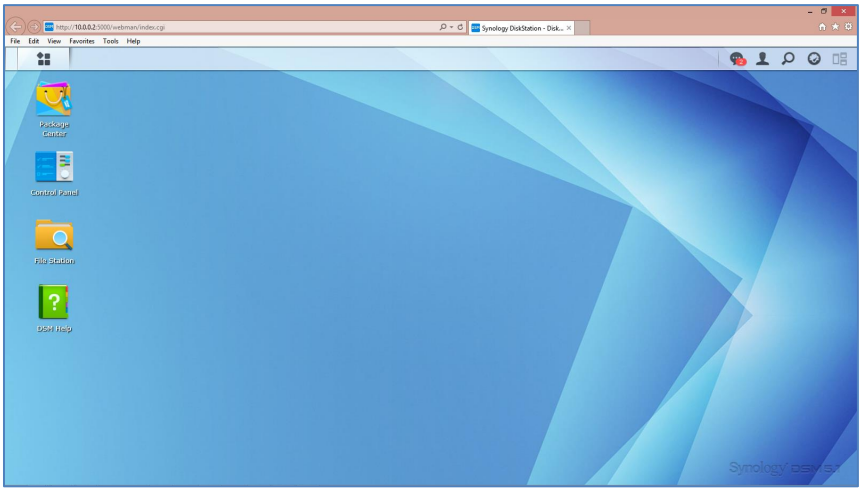


Once found, the NAS will be listed and the status will show **Ready** when it is up and running**.**

5. **Double click** on the Server name: DiskStation412 (the DS412+ NAS). The log in screen will show.
6. Enter the NAS **user name** and **password**. Consult the manual for the initial admin user name and password. You can always change it later.
7. Click on **Sign In**

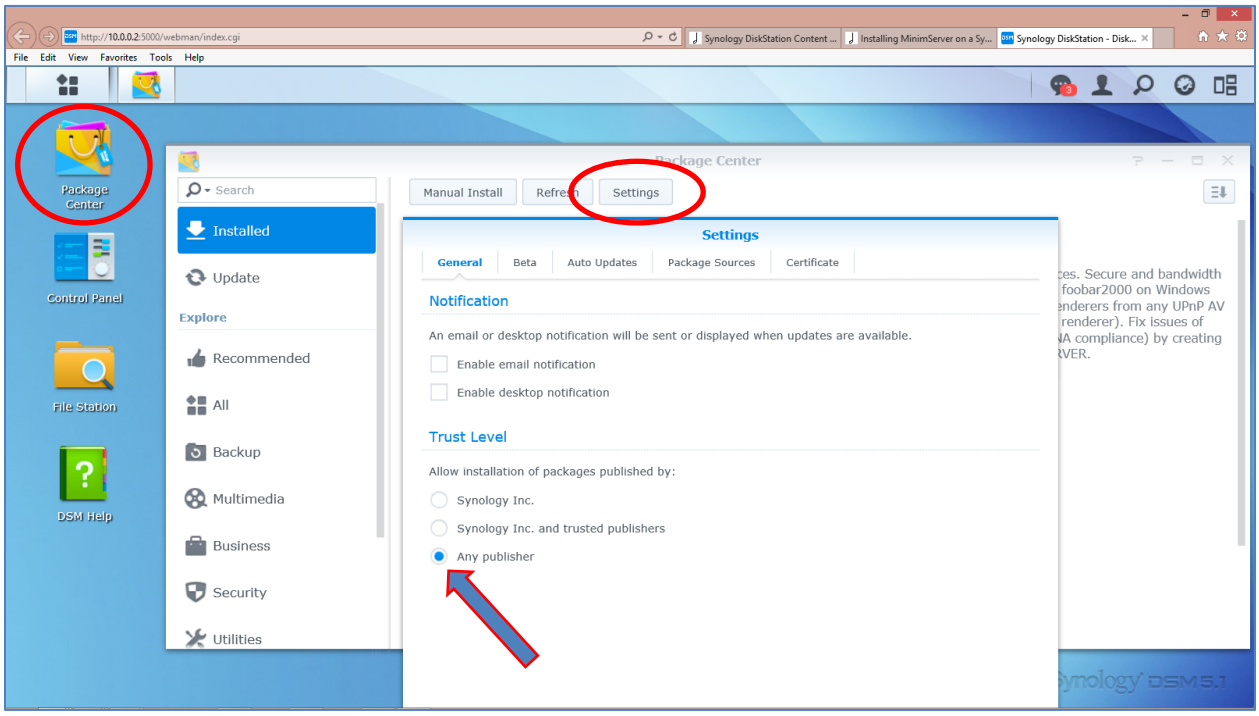


The main desktop of the Synology NAS now shows.

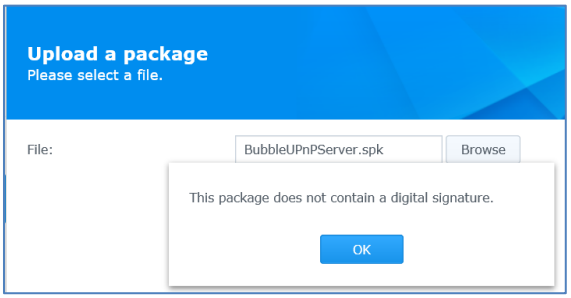


Before being able to install a third party package, you will need to change the Manual Install Settings to allow the Trust Level to Any publisher

8. Click on the Package Center icon
9. Click on the Settings button from within the Package Center screen and within the Trust Level section click on the Any Publisher radio button

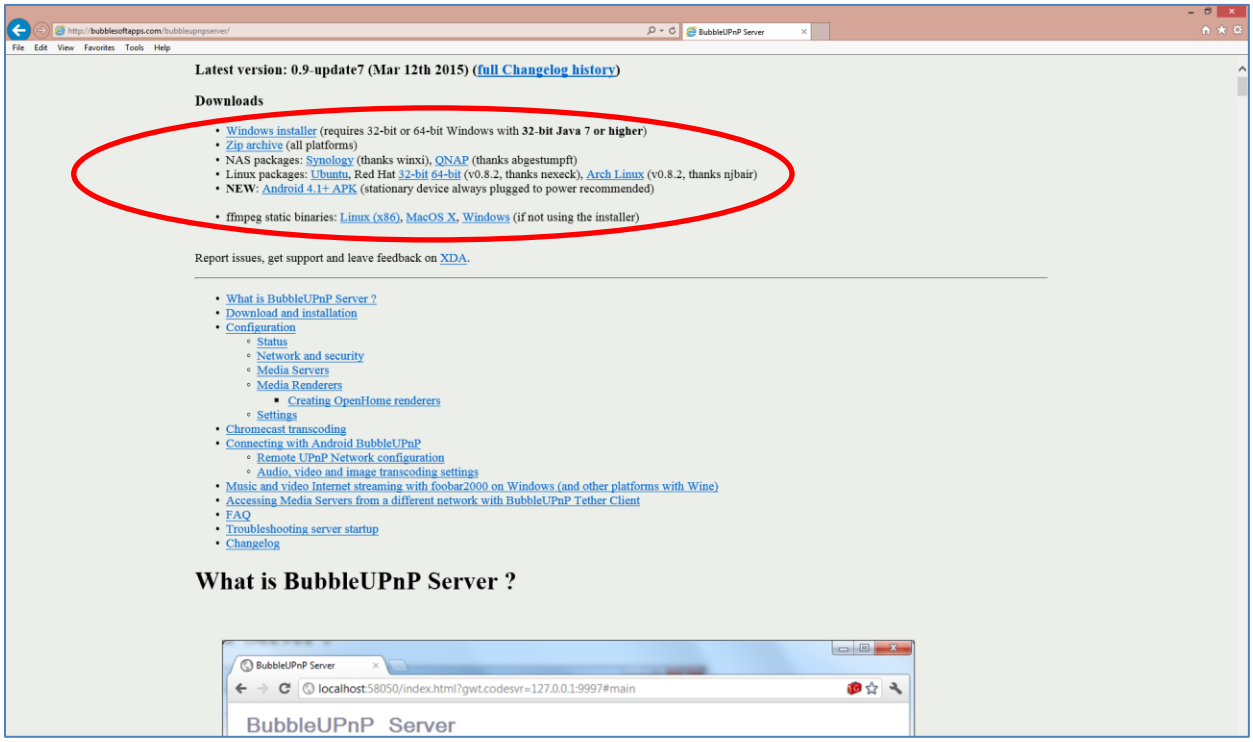


Note: If you do not complete this step, you will get the following error message when trying to install the Bubble UPnP Server

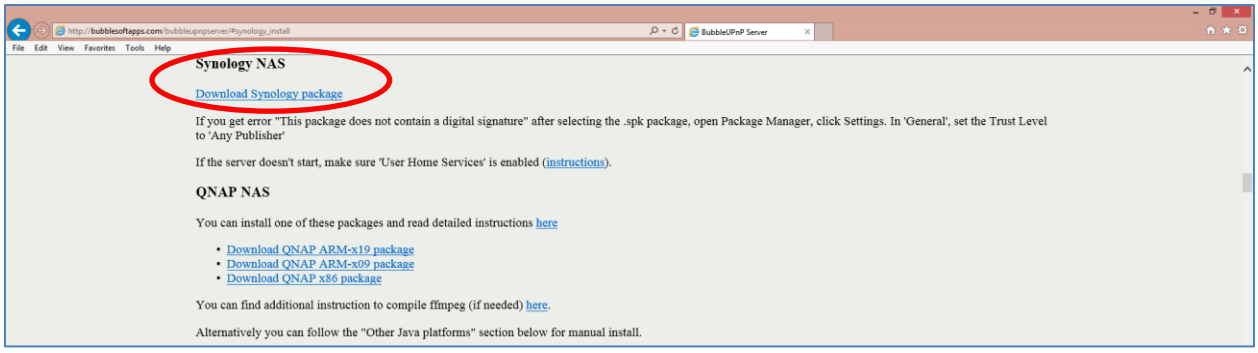


10. Navigate to the following Bubblesoftapps developer website to download the correct installation file of Bubble UpnP Server for your NAS from the Downloads section.

    - http://bubblesoftapps.com/bubbleupnpserver/

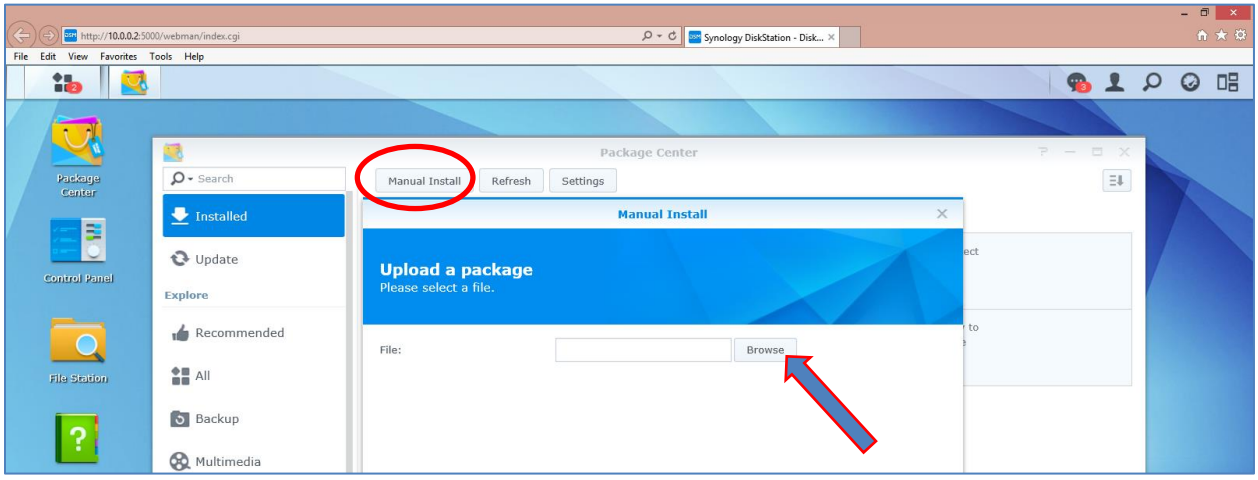

Latest version: 0.9-update7 (Mar 12th 2015) (full Changelog history)
Downloads
Windows installer (requires 32-bit or 64-bit Windows with 32-bit Java 7 or higher)
Zip archive (all platforms)
NAS packages: Synology (thanks winxi), QNAP (thanks abgestumpft)
Linux packages: Ubuntu, Red Hat 32-bit 64-bit (v0.8.2, thanks nexeck), Arch Linux (v0.8.2, thanks njbair)
NEW: Android 4.1+ APK (stationary device always plugged to power recommended)
ffmpeg static binaries: Linux (x86), MacOS X, Windows (if not using the installer)
Report issues, get support and leave feedback on XDA.
What is BubbleUPnP Server ?
Download and installation
Configuration
Status
Network and security
Media Servers
Media Renderers
Creating OpenHome renderers
Settings
Chromecast transcoding
Connecting with Android BubbleUPnP
Remote UPnP Network configuration
Audio, video and image transcoding settings
Music and video Internet streaming with foobar2000 on Windows (and other platforms with Wine)
Accessing Media Servers from a different network with BubbleUPnP Tether Client
FAQ
Troubleshooting server startup
Changelog
What is BubbleUPnP Server ?
BubbleUPnP Server
localhost:58050/index.html?gwt.codesvr=127.0.0.1:9997#main
BubbleUPnP Server

11. In our example, from the NAS packages bullet, click on the Synology hyperlink. Right click on the *Download Synology package* and save the **BubbleUPnPServer.spk** file to your computer's hard drive.

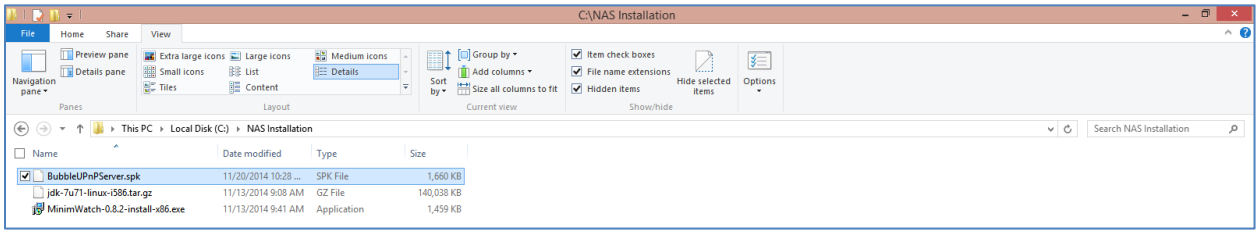

Synology NAS
Download Synology package
If you get error "This package does not contain a digital signature" after selecting the .spk package, open Package Manager, click Settings. In 'General', set the Trust Level to 'Any Publisher'
If the server doesn't start, make sure 'User Home Services' is enabled (instructions).
QNAP NAS
You can install one of these packages and read detailed instructions here
Download QNAP ARM-x19 package
Download QNAP ARM-x09 package
Download QNAP x86 package
You can find additional instruction to compile ffmpeg (if needed) here.
Alternatively you can follow the "Other Java platforms" section below for manual install.

Step 2. Install Bubble UpnP Server

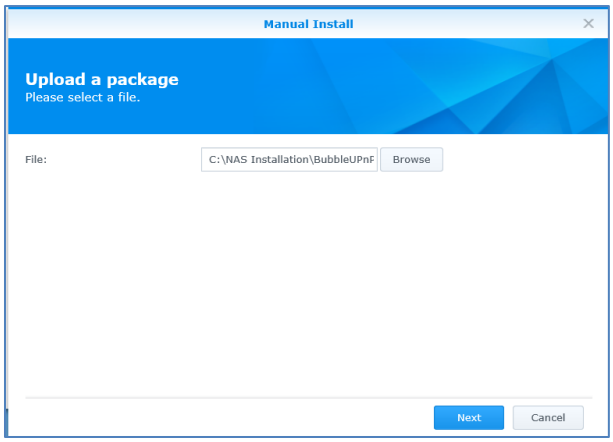
12. Click on the Package Center icon
13. Click on the **Manual Install** button from within the Package Center screen, and click on the **Browse** button



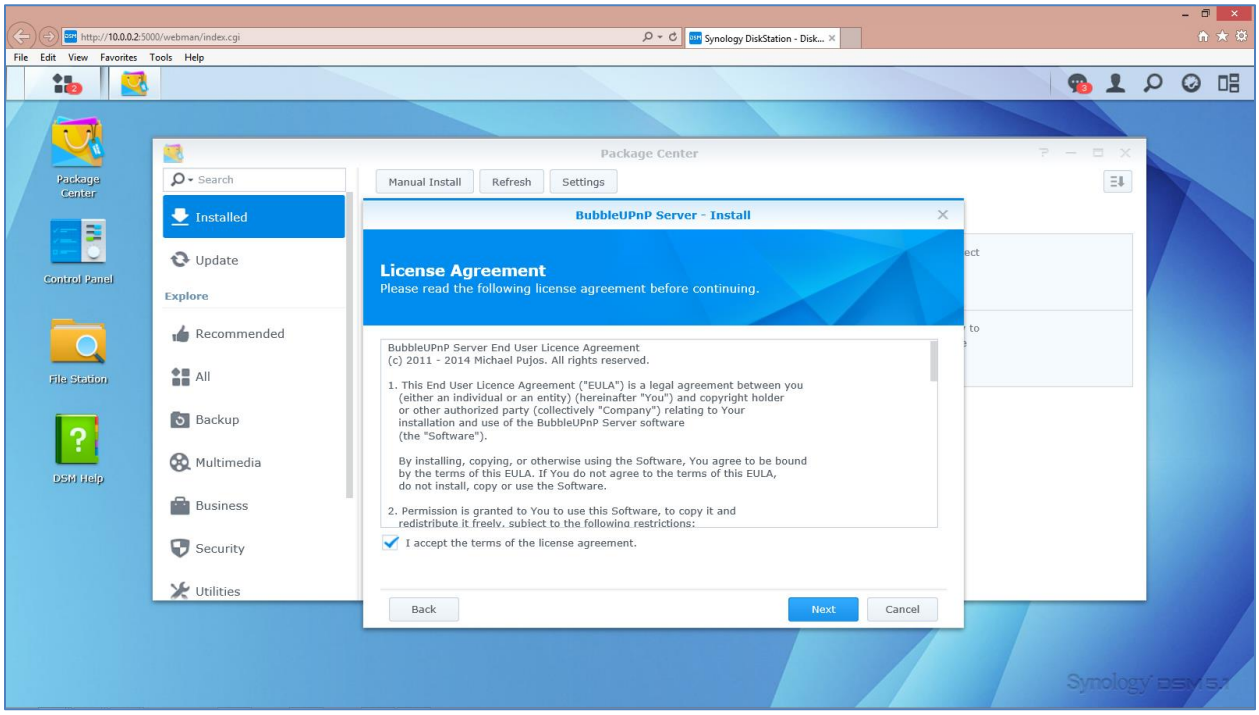
14. Navigate to the folder where you saved the **BubbleUPnP Server.spk** installation file



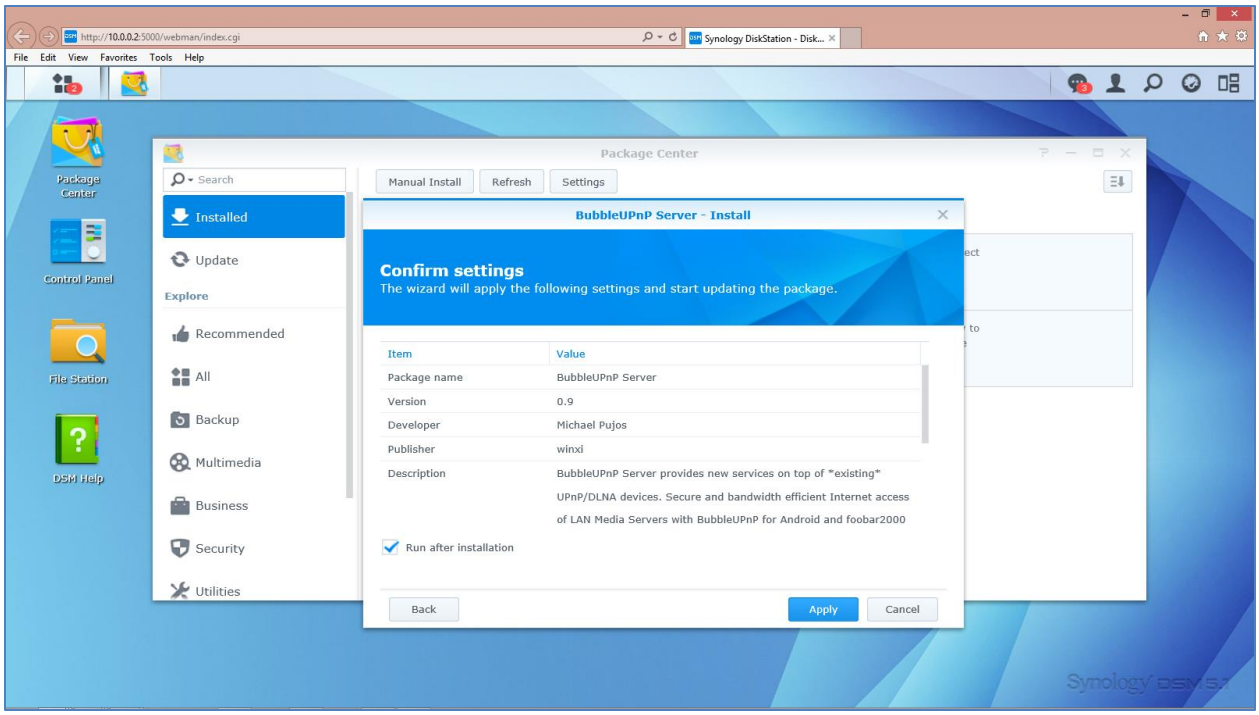
15. Select the **BubbleUPnP Server.spk** installation file and click **Next**



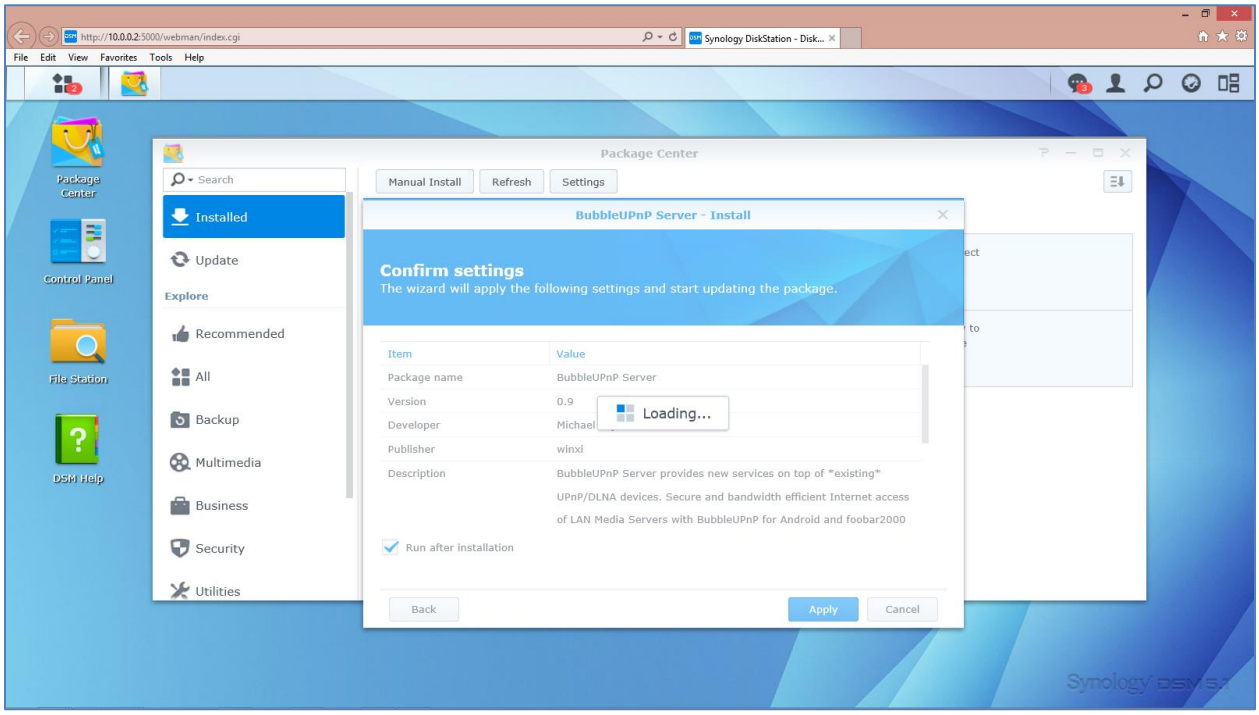
16. Check the box to accept the license and click **Next**


Package Center
Manual Install
Refresh
Settings
Installed
Update
Explore
Recommended
All
Backup
Multimedia
Business
Security
Utilities
BubbleUPnP Server - Install
License Agreement
Please read the following license agreement before continuing.
BubbleUPnP Server End User Licence Agreement
(c) 2011 - 2014 Michael Pujos. All rights reserved.
1. This End User Licence Agreement ("EULA") is a legal agreement between you
(either an individual or an entity) (hereinafter "You") and copyright holder
or other authorized party (collectively "Company") relating to Your
installation and use of the BubbleUPnP Server software
(the "Software").
By installing, copying, or otherwise using the Software, You agree to be bound
by the terms of this EULA. If You do not agree to the terms of this EULA,
do not install, copy or use the Software.
2. Permission is granted to You to use this Software, to copy it and
I accept the terms of the license agreement.
Back
Next
Cancel

17. Check the box to select the Run after installation, and click **Apply**

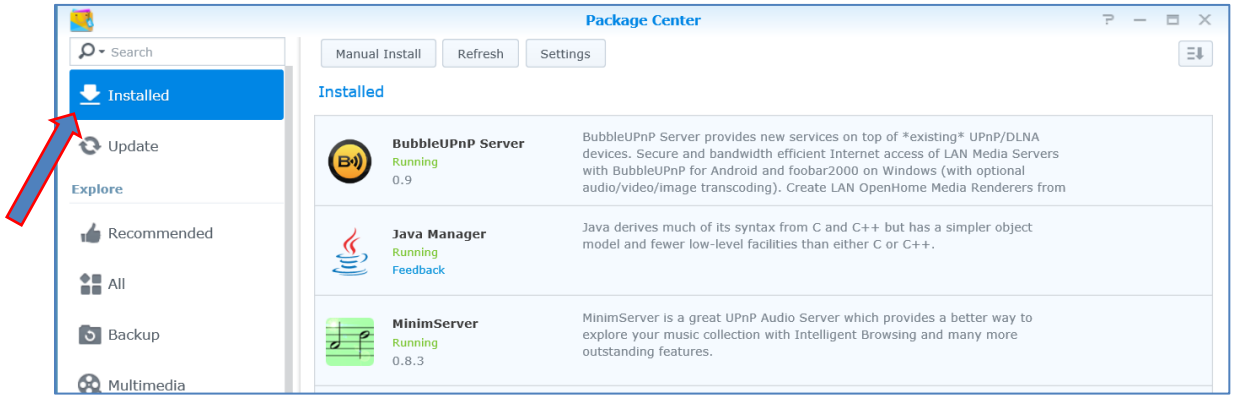


18. Wait a few minutes for the package to install. Please be patient.

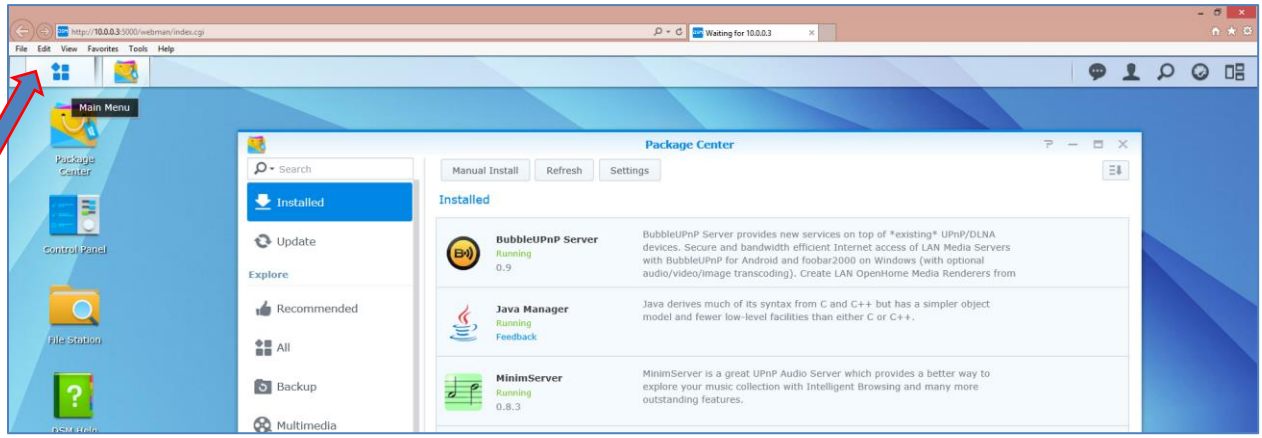


19. Once the installation is complete, click on the **Installed** section of the Package Center. You should now see 3 key packages running:

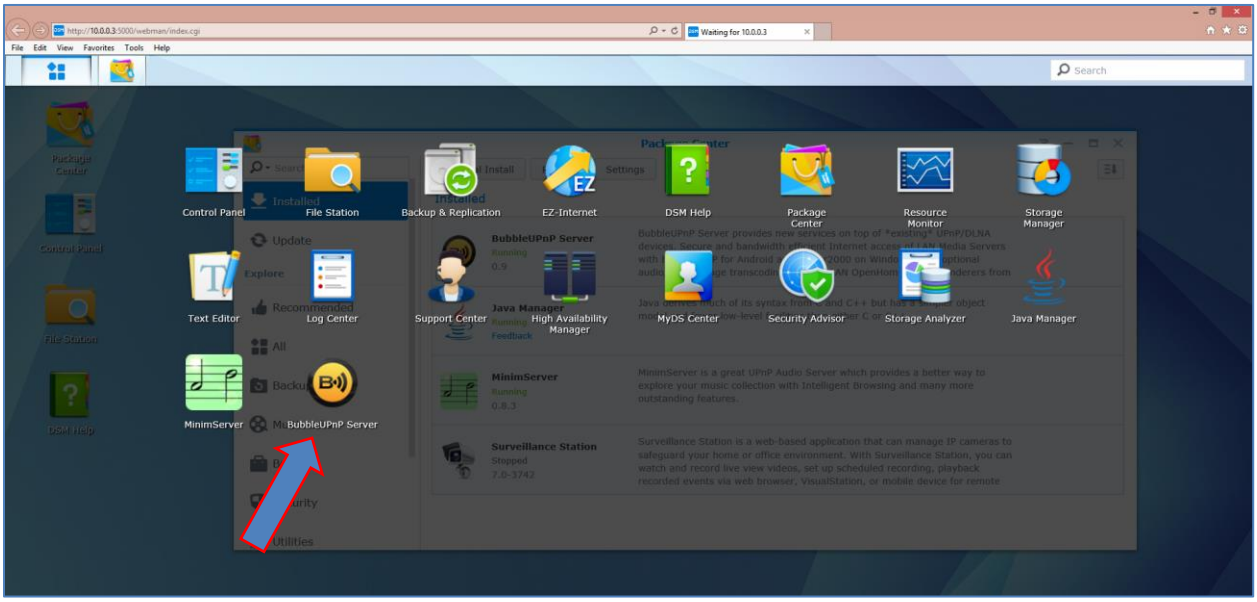
- BubbleUPnP Server – The ohMedia emulation server
- Java Manager – Required to run MinimServer
- MiniServer – The UPnP Server


Package Center
Search
Installed
Update
Explore
Recommended
All
Backup
Multimedia
Manual Install
Refresh
Settings
Installed
BubbleUPnP Server
Running
0.9
BubbleUPnP Server provides new services on top of *existing* UPnP/DLNA devices. Secure and bandwidth efficient Internet access of LAN Media Servers with BubbleUPnP for Android and foobar2000 on Windows (with optional audio/video/image transcoding). Create LAN OpenHome Media Renderers from
Java Manager
Running
Feedback
Java derives much of its syntax from C and C++ but has a simpler object model and fewer low-level facilities than either C or C++.
MinimServer
Running
0.8.3
MinimServer is a great UPnP Audio Server which provides a better way to explore your music collection with Intelligent Browsing and many more outstanding features.

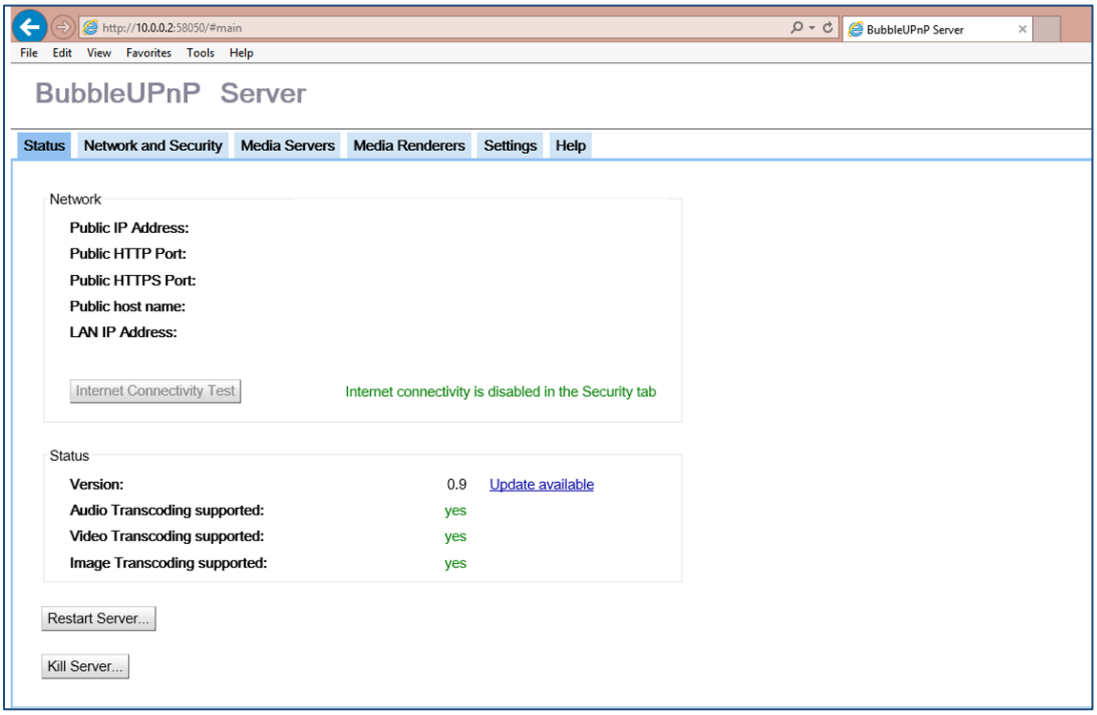
20. If the Bubble UPnP Server setup screen did not automatically open, click on the Main Menu icon in the top left hand corner.



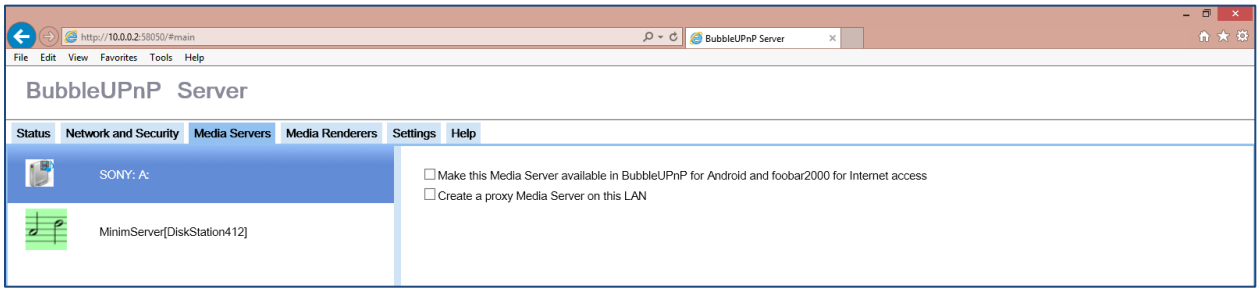
21. Click on the Bubble UPnP Server icon to open the setup menu



22. The BubbleUPnP Server menu will open on the status page. This is where you would be able to restart the Server if needed at a future time. No action is needed on this page.

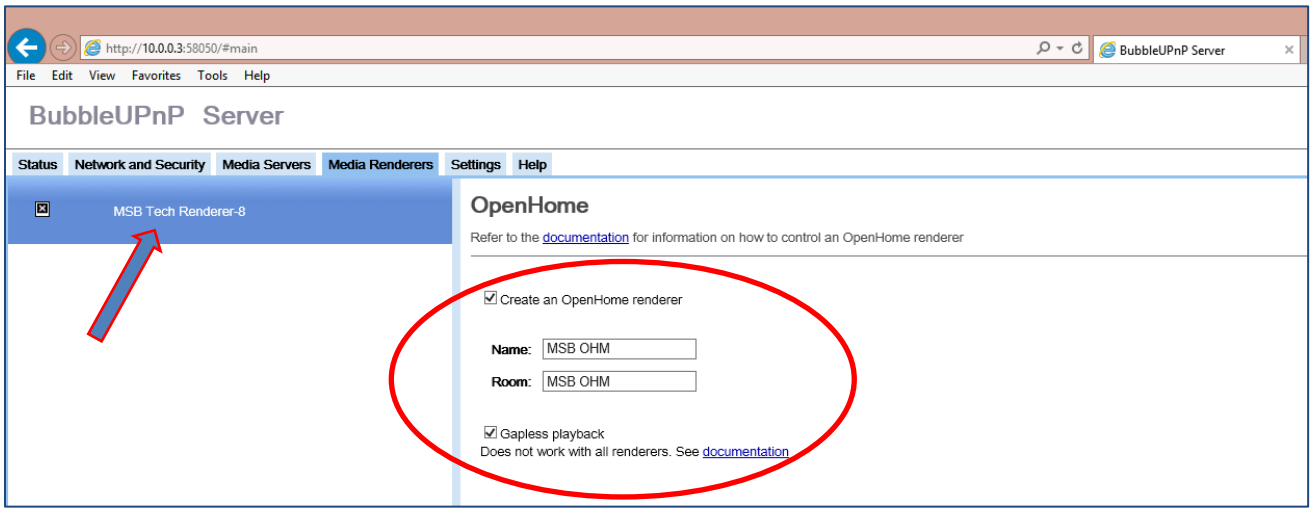


23. Click on the Media Servers tab. This will show your UPnP Media Server, MinimServer, or others if there are more available.



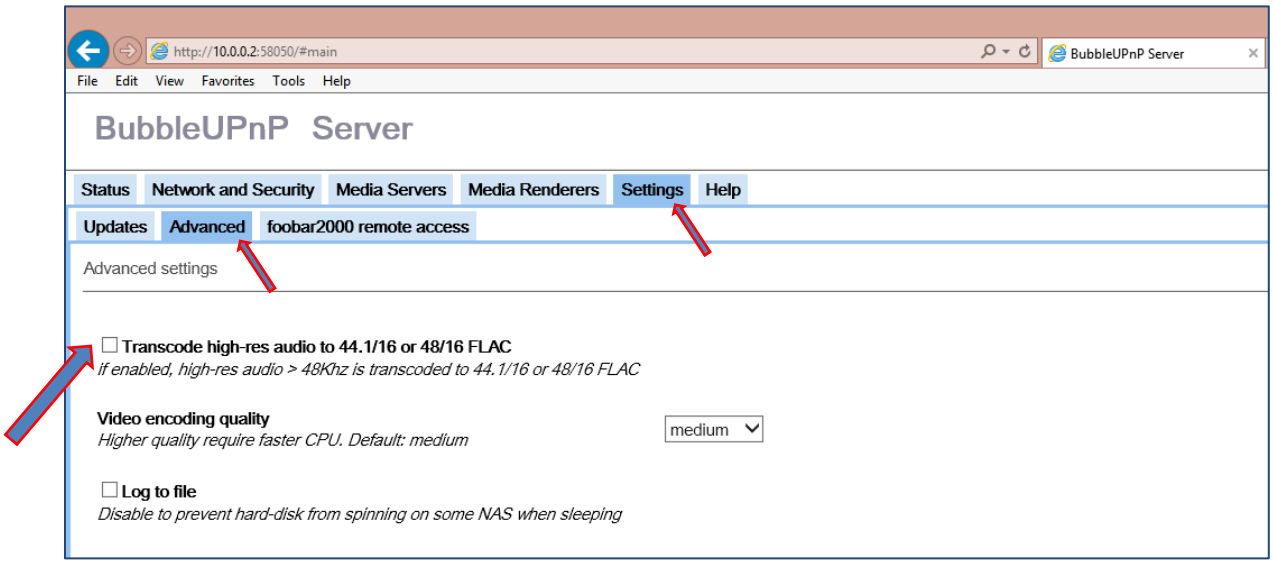
24. Click on the Media Renderers tab. This will show your UPnP Media Renderers on the network. MSB Network Renderer will show as its default name of **Audio** or **MSB Tech Renderer-X**, where X is the last digit of the IP Address given to the MSB Renderer by your router.
    - Select the MSB Tech Renderer.
    - Click on the checkbox to **Create an OpenHome renderer**
    - Change the Name according to your preference
    - Change the Room according to your preference
    - Check on the checkbox for **Gapless playback**

    Note: Because your ohMedia controllers will see both the UPnP Renderer and the emulated UPnP ohMedia Renderer version it is useful to put a prefix or suffix denoting the ohMedia emulation. In this example, OHM was added to the name.



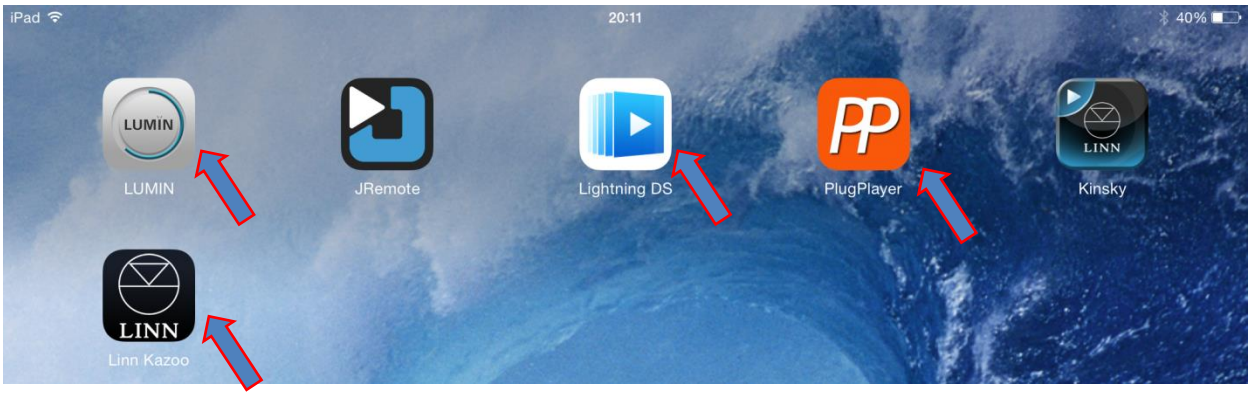
25. Click on the Settings Tab, followed by the Advanced sub tab.

- Uncheck the box with the selection **Transcode high-res audio to 44.1/16 or 48/16 FLAC**
- This is important, since we want to play back all our high resolution audio files at the high resolution.



26. You will now be able to use ohMedia Controllers such as :

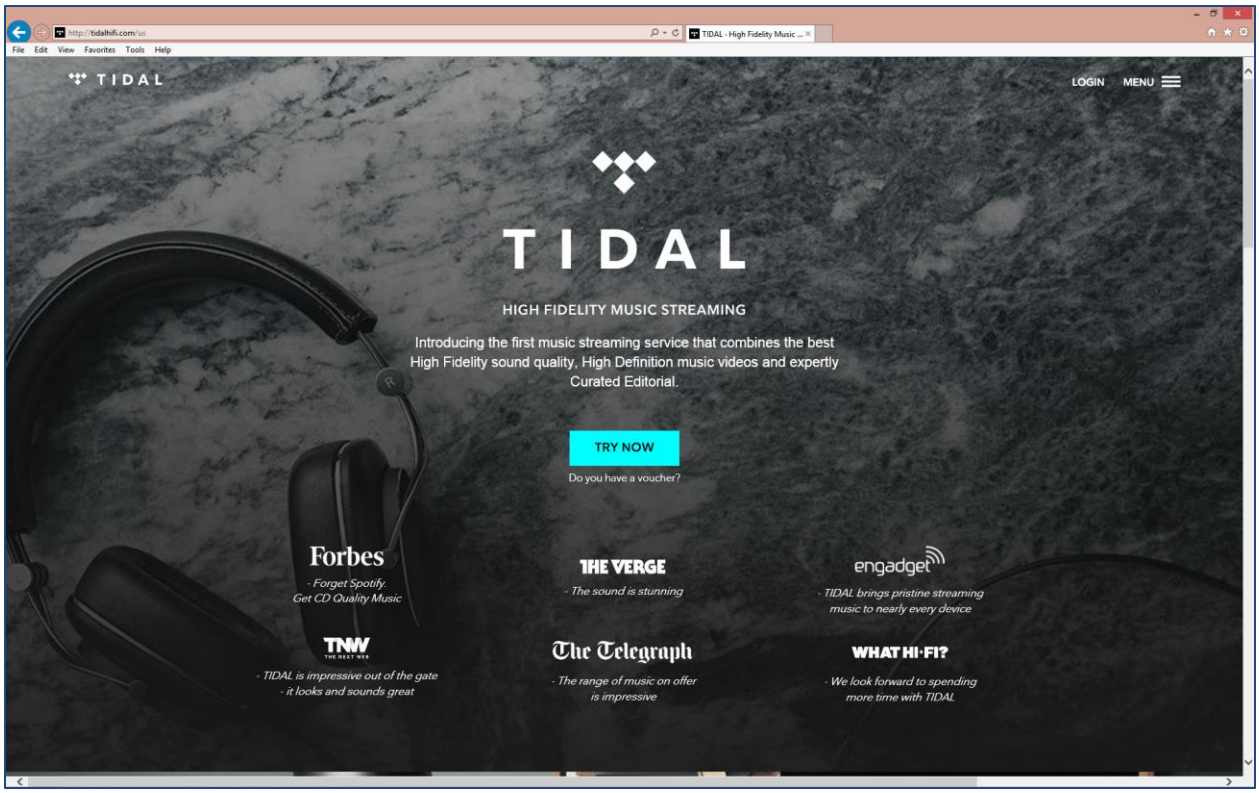
- Kazoo by Linn –Has a Tidal streaming function
- Lumïn
- Kinsky by Linn, PlugPlayer, Lightning DS by Auralic controllers can also function in ohMedia mode



7.7 Tidal Streaming Service on a NAS

Tidal (or WiMP in Europe) is a music streaming service based in Norway which provides high fidelity sound quality and is gaining popularity. It is a paid service with a monthly fee but it provides a limited free trial. Please check out details on the following website:

- http://tidalhifi.com/us

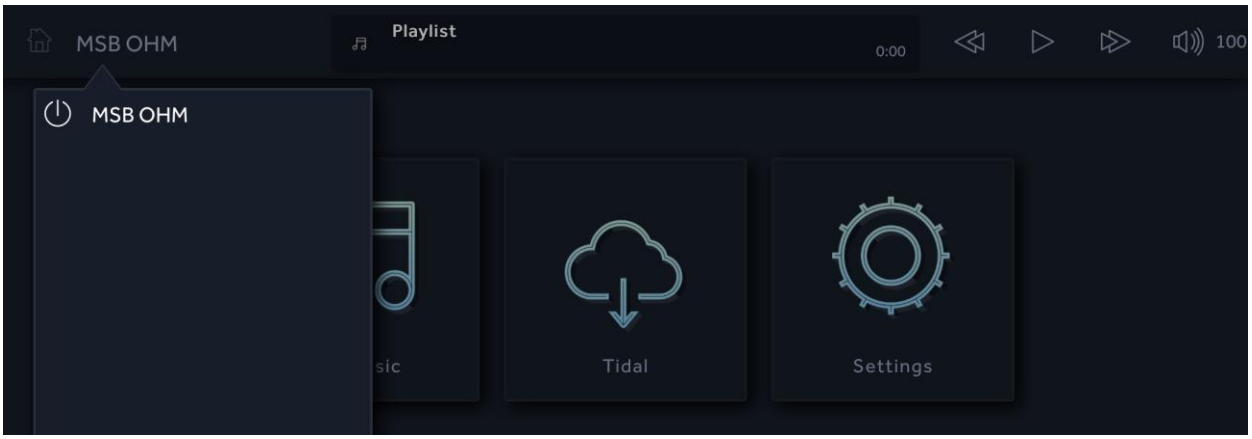

TIDAL
LOGIN
MENU
TIDAL
HIGH FIDELITY MUSIC STREAMING
Introducing the first music streaming service that combines the best High Fidelity sound quality, High Definition music videos and expertly Curated Editorial.
TRY NOW
Do you have a voucher?
Forbes
- Forget Spotify. Get CD Quality Music
THE VERGE
- The sound is stunning
engadget
- TIDAL brings pristine streaming music to nearly every device
TNW
- TIDAL is impressive out of the gate
- it looks and sounds great
The Telegraph
- The range of music on offer is impressive
WHAT HI-FI?
- We look forward to spending more time with TIDAL

In order to enjoy Tidal through the MSB Tech Renderer, the following steps need to be completed. Please refer to the previous chapters for the various installation steps.

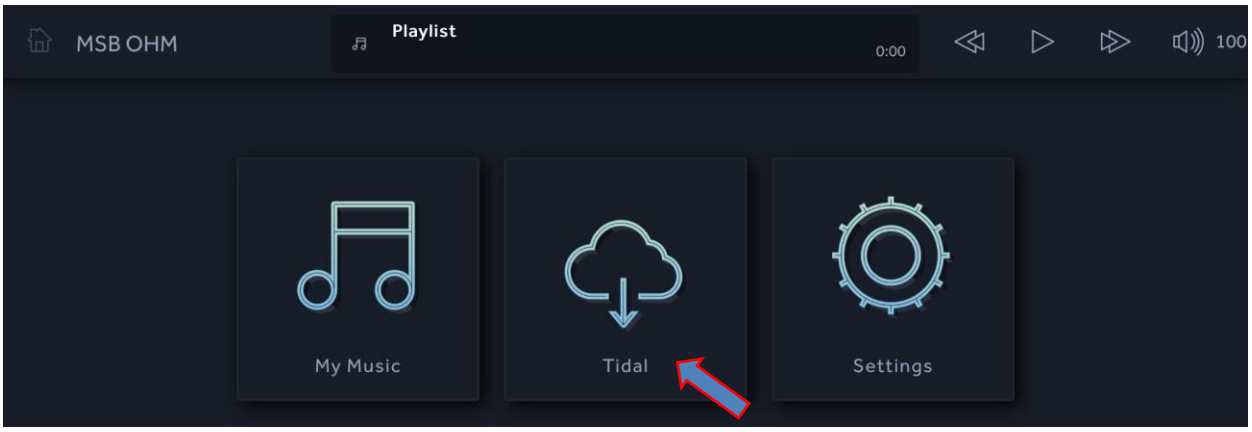
1. Create an account with **Tidal** streaming service
2. Install the **MSB Tech Renderer** and have it up and running on your network
3. Install and run the **MinimServer** UPnP server and have it up and running on your network
4. Install and run the **Bubble UPnP Server** to have the MSB Tech Renderer run in ohMedia emulation.
5. Install and run the **Linn Kazoo** ohMedia Controller on your pad

Once you have installed all the pre-requisites shown above, open up Linn Kazoo on your pad. We are using an iPad in this example.

Once Linn Kazoo is open, make sure that your MSB ohMedia emulation renderer is selected.

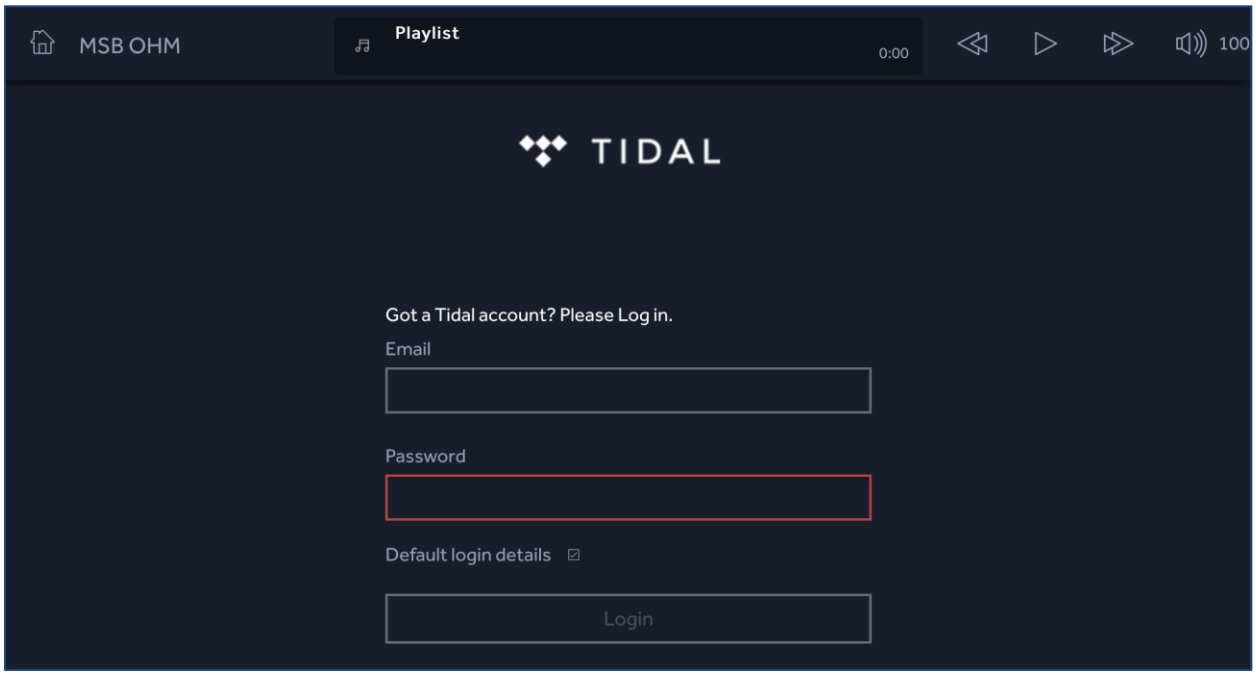


Click on the Tidal tile.

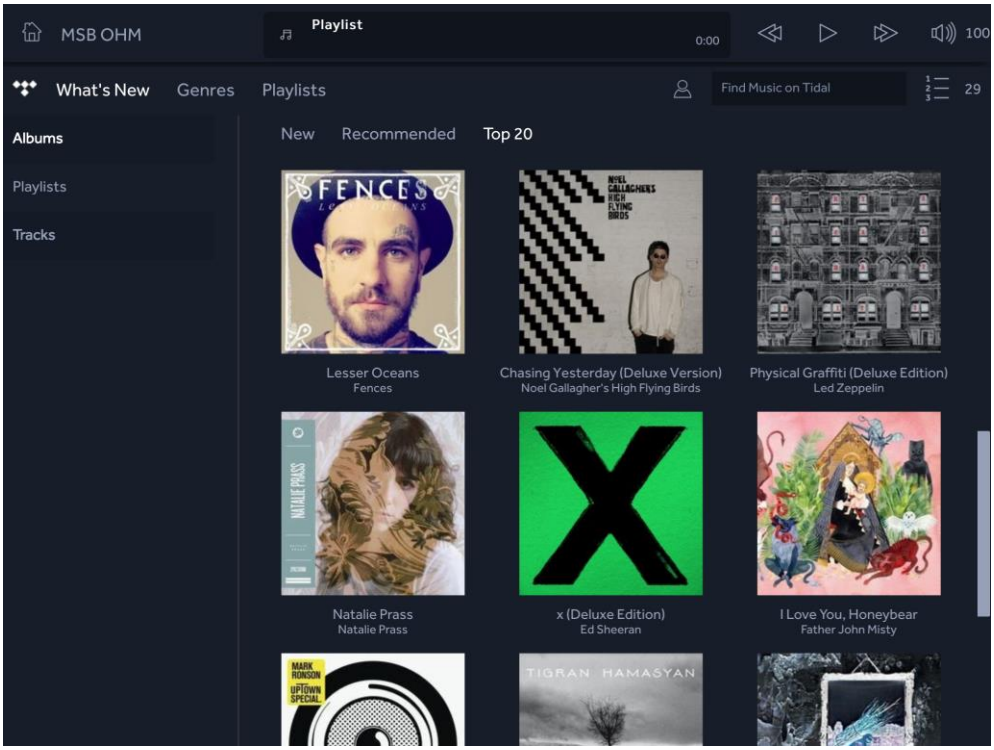


Log into Tidal using your login and password, and click on the **Login** button

Note: If you have just created a Tidal account and it is not being accepted. Please restart your MinimServer, Bubble UPnP Servers and Kazoo and try again.



Search for music and enjoy listening to the selection from your MSB Tech Renderer.



8. Support

Thank you for selecting the MSB Renderer Module.

Please visit our support website for any additional information

- http://www.msbtech.com/support/supportHome.php

For technical support with your MSB Product please contact:

- techsupport@msbtech.com

Warranty

All MSB products carry a one year warranty in the country of origin although extended warranties are offered in many countries. No returns accepted without an RMA. All units must be returned to the distributor in the country of origin. The DAC displays the distributor in the "about" tab of the menu. The power base has the distributor and country printed on the box. MSB will not make warranty repairs on grey market products. Be sure the product you purchased is authorized to be in your country. Upon receipt, MSB will repair or replace any defective product. All product shipped FOB Aptos. Shipping and shipping damage is the responsibility of the consignee.